

# Rock Products

\$2.00 A YEAR

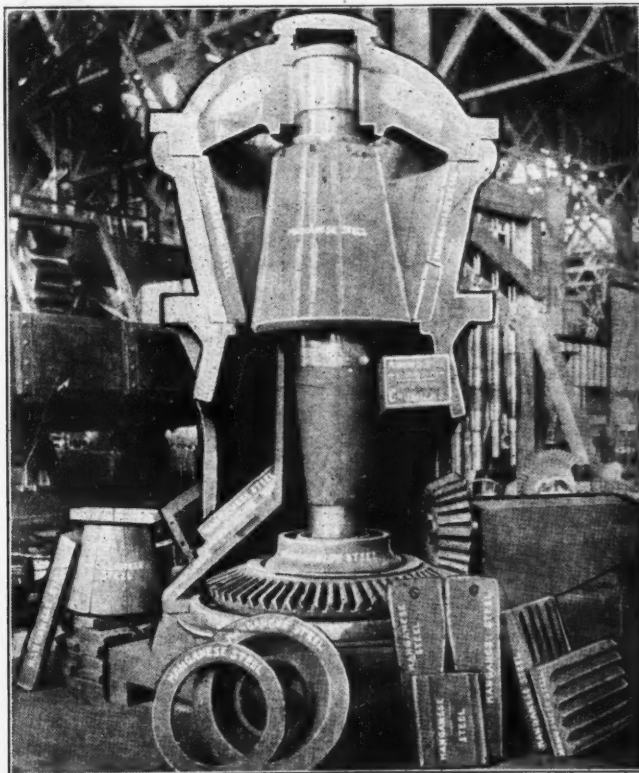
CHICAGO

DECEMBER 6, 1919

## Tisco Manganese Steel

A unique metal in great demand for hard service. A distinct alloy steel, containing about twelve per cent of manganese. The special Tisco process of treating toughens the castings, converting the original intrinsic brittleness into a ductile, malleable and thoroughly hardened product.

Tisco superiority is daily demonstrated where Tisco parts are subjected to heavy wear. They resist breakage. Their slight additional cost proves economical in the end. By their use the ordinary cost of disman-



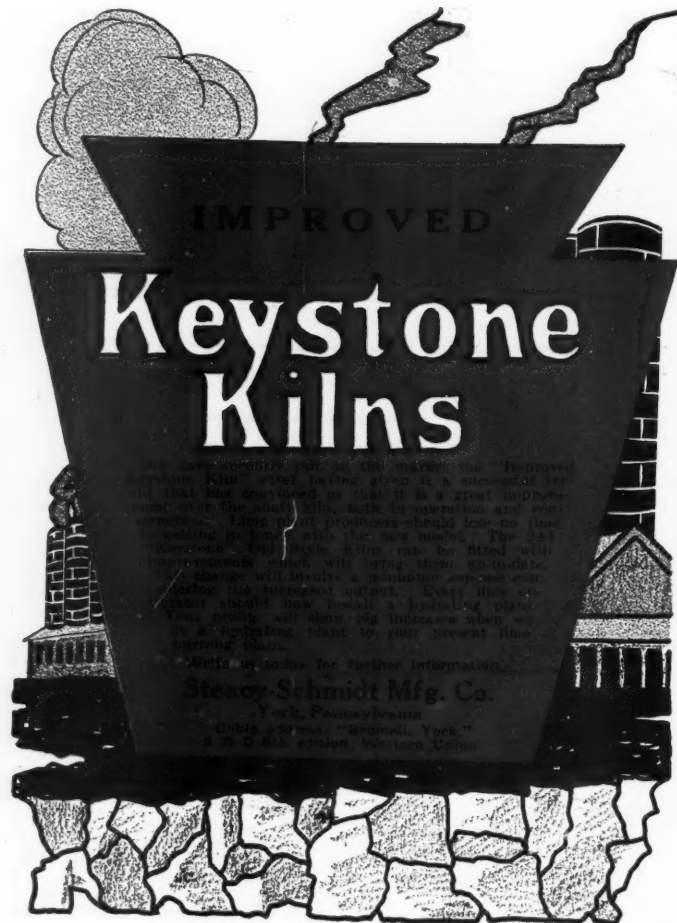
tlng a machine to remove a broken part is reduced to a minimum when compared to an installation of chilled iron or steel.

We recommend Tisco parts only where they will wear long enough to repay the user for the initial outlay.

Tisco products include: Rotary Pulverizer Parts, Machinery Parts, Gyratory and Jaw Crusher Parts, Chains, Sprockets and Conveyor Parts, Manganese Steel Gears and Pinions, Steam Shovel and Dredge Parts.

Write for quotations.

**TAYLOR-WHARTON IRON  
& STEEL COMPANY** **HIGH BRIDGE,  
NEW JERSEY**



**IMPROVED**

# Keystone Kilns

For crushing and pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

**PATENTED**

**Pennsylvania Crusher Company**  
New York      PHILADELPHIA      Pittsburgh

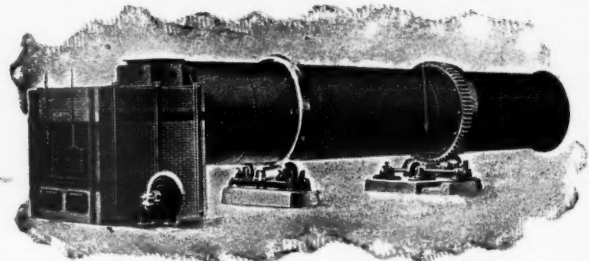
Write for today for further information.  
**Steiner-Schmidt Mfg. Co.**  
York, Pennsylvania  
Cuba Avenue, "Brooklyn, York"  
2nd & 3rd Streets, Western Union

## "PENNSYLVANIA" Hammer Crushers



For Crushing and Pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

**PATENTED**  
**Pennsylvania Crusher Company**  
New York      PHILADELPHIA      Pittsburgh



## DRYERS

**AMERICAN PROCESS CO.** 68 Williams Street  
NEW YORK CITY

## ATTENTION

**Cement Manufacturers  
and Supply Dealers**

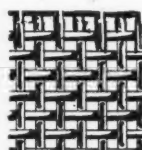
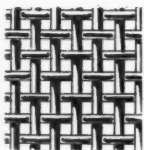
USE  
**JAITE  
PUNCTURE  
AND  
WATERPROOF  
BAGS**

**FOR SAFE  
DELIVERIES**

Some of our customers who are using our Puncture and Waterproof bags report one-third increased sales to their satisfied customers. Also report breakage for 1917 and 1918 from all causes only one-half of one per cent.

**THE JAITE CO.**

JAITE, OHIO  
Sole Manufacturers



## Audubon Double Crimped Wire Cloth

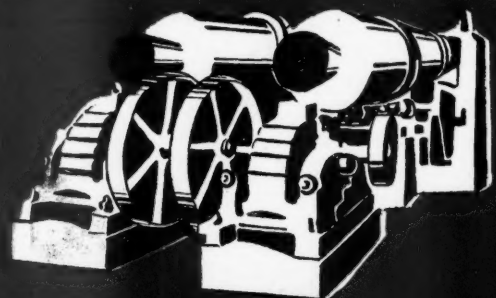
A uniform product assuring maximum production and uniformity of results.

Wire cloth of iron, steel, brass, galvanized and special metals for every purpose.

Detailed information in catalog  
Copy on request

**Audubon Wire Cloth Co., Inc.,**

Audubon, N. J.  
Three miles from Philadelphia



1000 in Use—24% On Repeat Orders

That's a good enough record to win over any other dryer. It proves at once both the widespread use and the merit of

## RUGGLES-COLES DRYERS

There's nothing else out there. We will be pleased to send you a complete catalog and any of your drying problems. We are a team; day, year in and year out, we are not only in the business but we are in it.

**RUGGLES-COLES ENGINEERING CO.**

10 Church St., New York 332 S. Michigan Ave., Chicago, Ill.

For better service say, "I saw it in ROCK PRODUCTS"



*In its swift, smooth gliding over the pulleys of this highly efficient Power Plant, Test Special Rubber Belting typifies inherent strength and dependability.*

## THE BELT FOR ENDURING SERVICE

On drives of the hardest kind everywhere—in Saw Mills, Paper Mills, Cement Plants, Machine Shops, Textile Mills, etc., Test Special Rubber Belting not only is performing faithful service, but is standing guard against costly shutdowns and delays.

The friction surface affords the strongest pulley grip. The extreme flexibility permits the running over small pulleys at high speeds. The plies of cotton duck—of great tensile strength—are inseparably united by a tenacious rubber friction.

**Test Special Rubber Belting is Made  
to Serve You Well**



**New York Belting & Packing Co.**

MAKERS OF BELTING SINCE 1846

BOSTON  
CHICAGO

NEW YORK  
PHILADELPHIA  
PITTSBURGH

ST. LOUIS  
SAN FRANCISCO



*Saying, "I saw it in ROCK PRODUCTS," will bring quick action*



# Rock Products

TRADEPRESS PUBLISHING CORPORATION  
542 SOUTH DEARBORN STREET  
CHICAGO

NATHAN C. ROCKWOOD, Editor

CHAS. H. FULLER, Manager

C. F. TREFZ, Associate Editor

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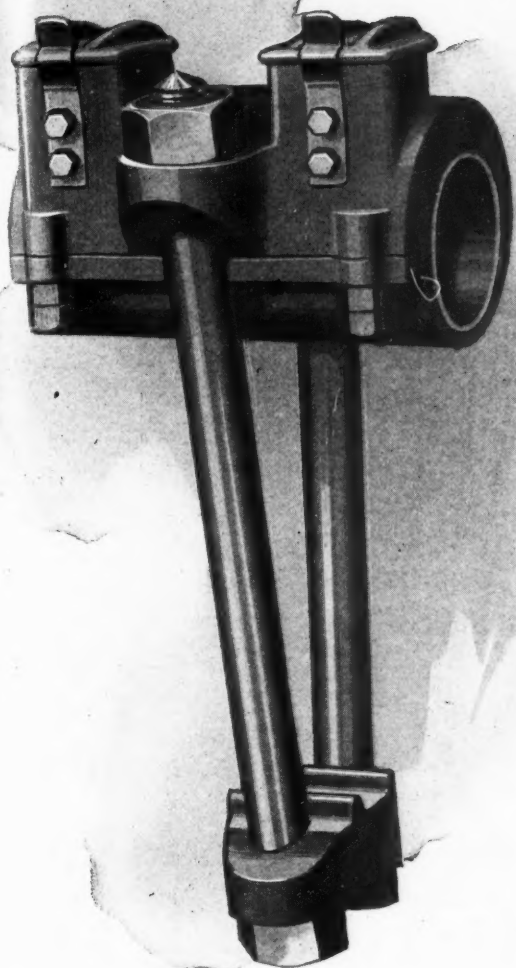
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## The "Bulldog" Pitman

— the lightest but by far the strongest pitman ever put into a Jaw Crusher—is shown to the left. Those two rods that take the place of a heavy casting, are of **wrought steel**; their strength is known, not guessed at, as in a casting. Either of those rods alone could carry the entire crushing load. And the "Bulldog" Pitman is only one feature of

## TRAYLOR "Bulldog" Jaw Crushers

The "Bulldog" Self-Aligning Toggle System is **frictionless**—its toggle ends roll on flat steel seats—lubrication is unnecessary—and

these two features, the "Bulldog" Pitman and Toggle System, eliminate 80% of the friction load found in Blake Type Crushers.

There are many other features of the "Bulldog" Jaw Crushers—among them the cast semi-steel frame reinforced by steel bands of great strength—all of which contribute toward the exceptional economics for which the "Bulldogs" are noted.

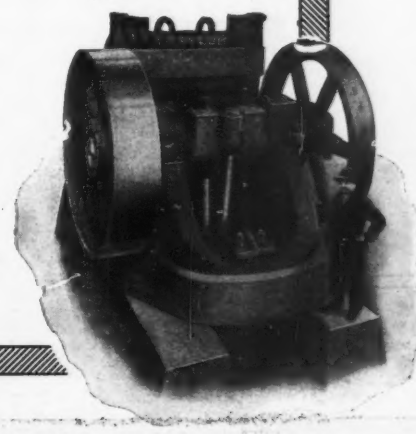
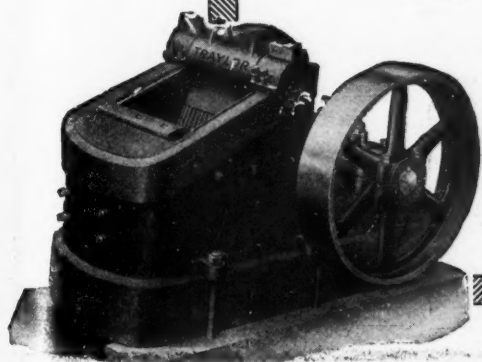
Send for Bulletin R-JX-1 and see what a Traylor installation will mean to you!

## Traylor Engineering & Mfg. Co.

Main Offices and Plant:  
Allentown, Penna.

### District Offices:

New York	Chicago
30 Church St.	1414 Fisher Bldg.
Pittsburgh	Los Angeles
211 Fulton Bldg.	Citizens Bank Bldg.
Spokane	
Mohawk Block	



Cooperation is the thing—please mention **ROCK PRODUCTS**



**Railroad Grading  
Drainage Ditches  
Irrigation Canals**

**Levee Building  
Embankments  
Wagon Loading**

**Highway Grading**

The history of railroad and earth construction work for the past 35 years has been the story of THE NEW ERA ELEVATING GRADER.

Old experienced contractors still "in the game," as well as many who have "passed along" learned years ago to look upon the "New Era" as the most essential piece of equipment on a successful grading job.

PRESENT DAY road builders have recognized the advantages of the "New Era" in solving their grading difficulties. It is good for both grading and excavating the road bed; in the latter case, getting the material out of the grade to the wagon or ditch in one movement is a worth-while labor-saving achievement.

### **Austin Dump Wagons**

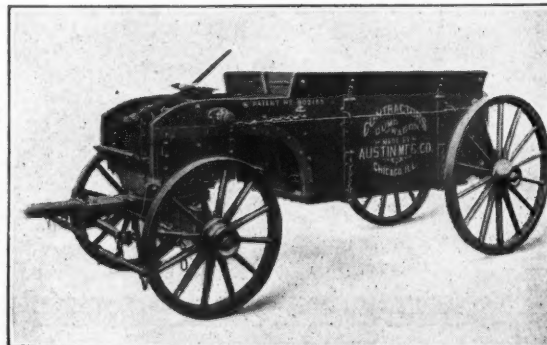
are popular with contractors because they are

- Easy to load (being low)**
- Easy on teams (having short wheel base)**
- Easy to dump (hingeless doors clear the material)**

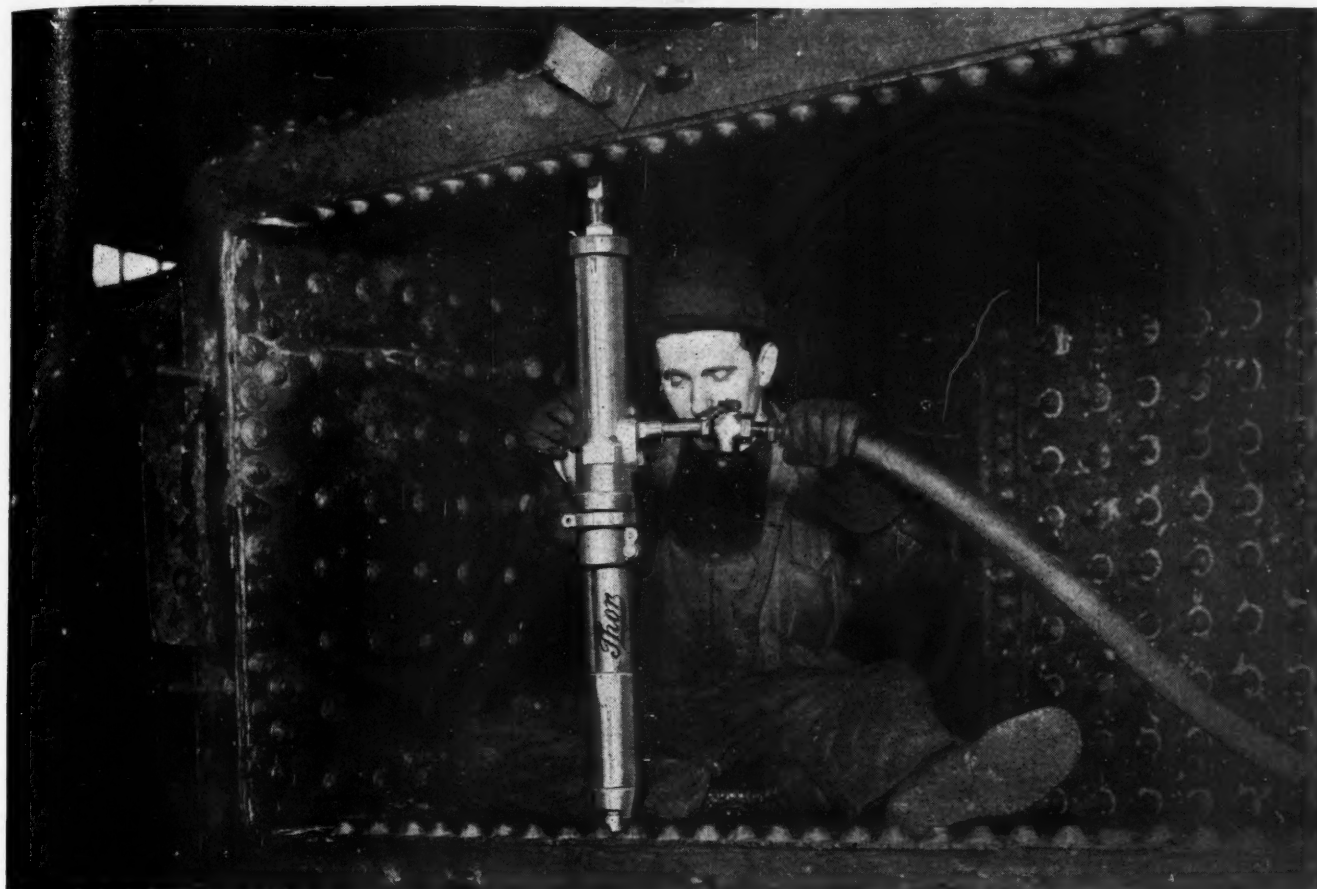
## **Austin Manufacturing Company CHICAGO**

**New York**

**San Francisco**



*For better service say, "I saw it in ROCK PRODUCTS"*



## Monterey Keeps Air Tools on the Job —It's Light, Strong and Oil-Resisting

The stout-bodied fabric of Goodyear Monterey Air Hose is steadfast assurance against kinks, cracks and bursts.

The high-grade, resilient rubber of Goodyear Monterey resists the rotting action of oil and provides the easy flexibility of a natural expansion and contraction under the recurrent pressures of the air.

Together—new, live rubber and long, tough fibre, firmly compacted in Goodyear special wrapped construction—

they provide in Goodyear Monterey an air hose superior as to non-porosity, light in the hands of the workman, and successfully resistant to abrasion.

The wearing qualities of Goodyear Monterey, and its high operating efficiency, reduce its slightly higher first cost to an element of genuine economy.

Goodyear Monterey comes in 25- and 50-foot lengths.

THE GOODYEAR TIRE & RUBBER CO.  
*Offices Throughout the World*

BELTING • PACKING  HOSE • VALVES  
**GOODYEAR**  
MADE IN U.S.A.

*The advertiser wants to know that you saw his ad in ROCK PRODUCTS*





*Another*  
**FEDERAL**

*Federal dump truck dumping and spreading a load of crushed stone. Owned by the Iowa Stone Company, Cedar Rapids, Iowa.*

*"Return Loads Will Cut Your Haulage Costs"*

## Efficiency

"Ship by Truck" is becoming the slogan of a quickened industrial world.

Contractors—builders—manufacturers—farmers—merchants—consumers—all benefit alike thru response to this new appeal in business.

To "Ship by Truck" is to increase production, facilitate distribution, relieve freight congestion and cut the cost of living.

Because it is built for dependable service, a Federal Truck will give you years of unfailing, economical haulage—regardless of whether your business involves the long or short haul.

Ship by truck. And let your carrier be the time-tested, sturdy, steel-hard and proven Federal.

*"Traffic News"—a Monthly Magazine on Better Haulage—Mailed Free on Request*

**FEDERAL MOTOR TRUCK COMPANY**  
43 FEDERAL STREET DETROIT, MICHIGAN

**FEDERAL**  
*One to Five Ton Capacities*

*You will get entire satisfaction if you mention ROCK PRODUCTS*

## FULL SPEED AHEAD!



HERE are some of the largest stone and cement producers who have standardized with Marion Shovels:

Bessemer Limestone Co.	-	Youngstown, O.
Casparis Stone Co.	-	Columbus, O.
Carbon Limestone Co.	-	Youngstown, O.
Dewey Portland Cement Co.	-	Dewey, Okla.
Erie Stone Co.	-	Toledo, O.
Empire Limestone Co.	-	Cambria, N. Y.
English Stone Co.	-	Willow, Ky.
France Stone Co.	-	Toledo, O.
Great Lakes Stone & Lime Co.	-	Alpena, Mich.
Johnston G. W. Limestone Co.	-	New Castle, Pa.
Kelley Island Lime & Transport Co.	-	Cleveland, O.
Lehigh Portland Cement Co.	-	Allentown, Pa.
Lake Erie Limestone Co.	-	Youngstown, O.
Marble Cliffs Quarries Co.	-	Columbus, O.
Michigan Limestone & Chemical Co.	-	Rogers City, Mich.
Michigan Alkali Co.	-	Alpena, Mich.
National Lime & Stone Co.	-	Carey, O.
Ohio Marble Co.	-	Piqua, O.
Pittsburgh Limestone Co.	-	New Castle, Pa.
Rock-Cut Stone Co.	-	Syracuse, N. Y.
Solvay Process Co.	-	Siblay, Mich.
U. S. Portland Cement Co.	-	Concrete, Colo.
Wickwire Limestone Co.	-	Gasport, N. Y.
Wallace Stone Co.	-	Bayport, Mich.
Whitehouse Stone Co.	-	Toledo, O.

**Q**UARRYMEN expect 1920 to be one of the biggest, busiest years ever known in the industry.

States, counties, townships and municipalities are planning extensive programs for repairing neglected roads and building new ones. Thousands upon thousands of tons of crushed stone will be needed for this gigantic task.

The railroads, handicapped by lack of labor and supplies, have been unable to keep their road-beds properly ballasted. They are now bringing their equipment up to pre-war standards. Next season they will be in the market for thousands of carloads of ballast rock.

How will you be prepared to meet this great demand—to fill the orders that will come your way—to get your share of the profits?

Standardize your loading equipment with Marion Steam Shovels as many successful quarries have done. Learn what it means to be almost independent of labor—and to have a shovel that will work uninterruptedly, day after day, at the hardest, roughest, most racking job in the whole steam shovel calendar.

There's a book that tells the story—"Crowding the Blasting Crew." Shall we send you a copy?

**THE MARION STEAM SHOVEL CO.**

Established 1884

Marion, Ohio

NEW YORK

CHICAGO

ATLANTA

SAN FRANCISCO

# Marion

Prompt attention will be given your inquiry if you mention **ROCK PRODUCTS**

# Keeping trucks out of the shop

**T**HE efficiency of a truck depends on the aggregate work it does. So we leave nothing undone to keep your Pierce-Arrow trucks working.

We build them as carefully as fine machines must be built if they are to last—of right design and the best materials. We test them thoroughly *before* we sell them.

Our interest doesn't stop there. We teach your men to handle them and we inspect them monthly to prevent abuse or neglect. All of our experience is at your disposal.

This care keeps Pierce-Arrows out of the shop and on the job—rolling up mileage, piling up earnings.

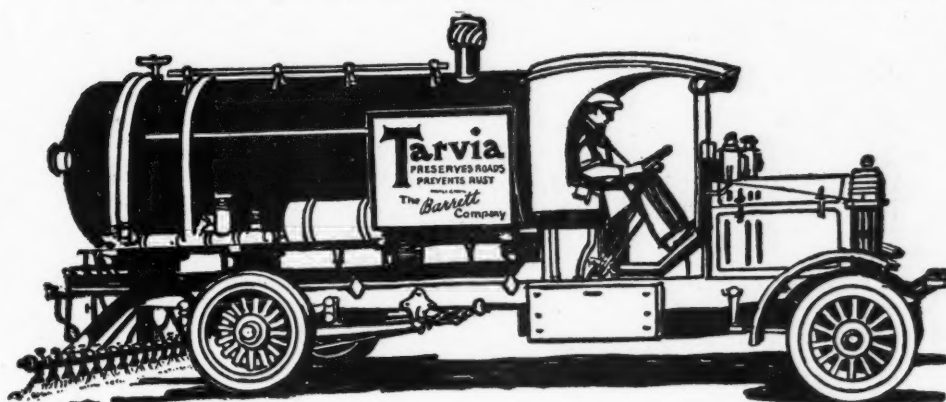
That is why Pierce-Arrows are the cheapest trucks to buy, why none has worn out in 8 years.



*To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry*



**T**HE BARRETT COMPANY operates a fleet of thirty-four Pierce-Arrows throughout the east. Their tank trucks used for spreading Tarvia road dressing, operate on a radius of forty miles around supply cars, and have demonstrated remarkable dependability.



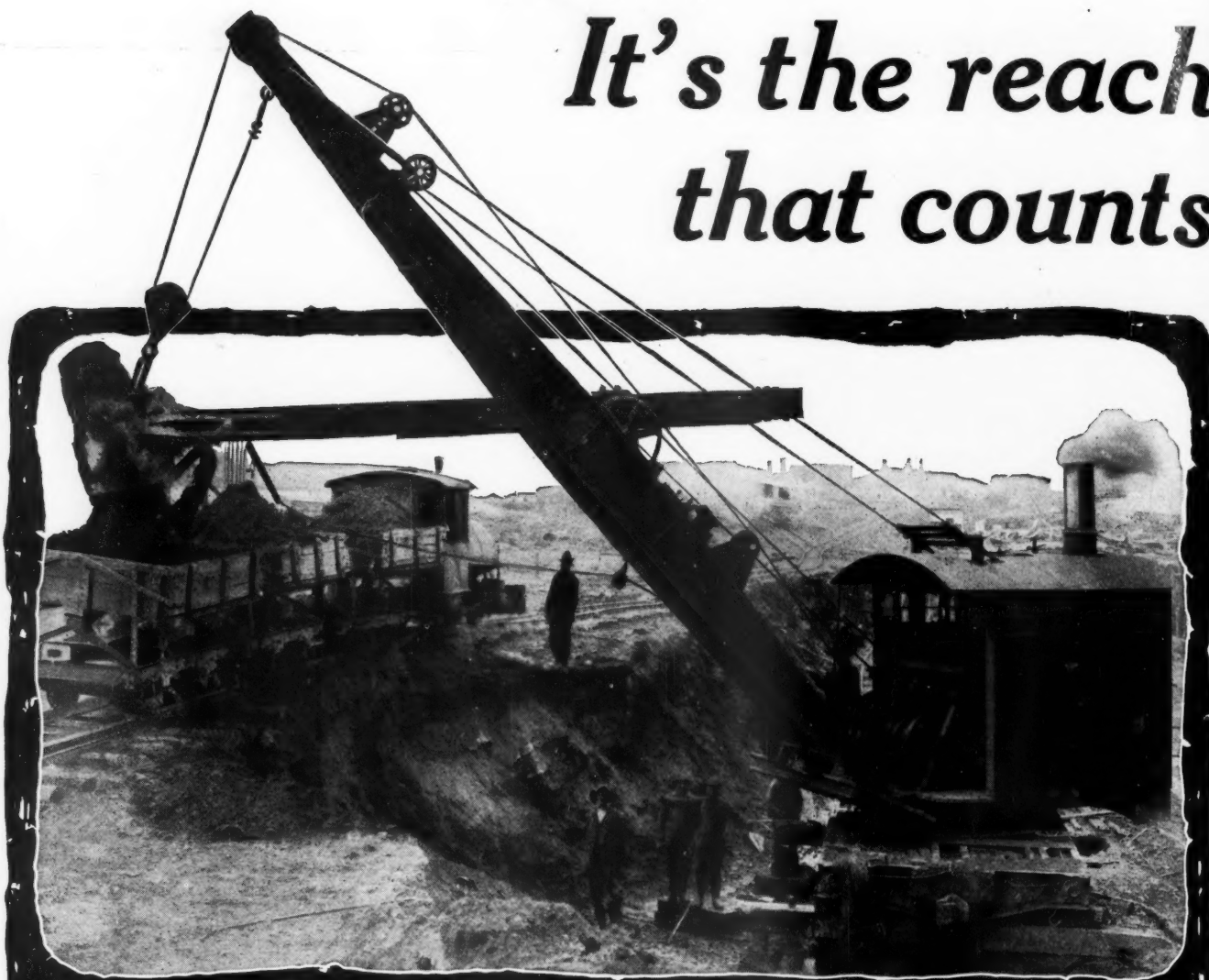
Delivers more work in a given time;  
Loses less time on the job and off the job;  
Costs less to operate and less to maintain;  
Lasts longer, depreciates less and commands  
a higher resale price at all times.

THE PIERCE-ARROW MOTOR CAR CO.  
BUFFALO, N. Y.

# Pierce Arrow

*It gets immediate attention if you mention ROCK PRODUCTS*

*It's the reach  
that counts*



### All-Around Adaptability Spells Profits

**W**HEN you buy a Browning Crane you know that you are protected on every job. The owner of this Browning Crane did not have to buy a steam shovel when this job of excavating came along. Note the long reach and high dump. When you consider that tomorrow this same crane may be driving piles and the following day setting structural steel or handling a bucket, you will understand why Browning Locomotive Cranes are such profit makers.

*A catalog illustrating the wide adaptability of Browning Cranes sent on request.*

**THE BROWNING COMPANY**  
CLEVELAND, OHIO

New York  
Chicago

Seattle  
Portland

— SALES OFFICES —  
Salt Lake City

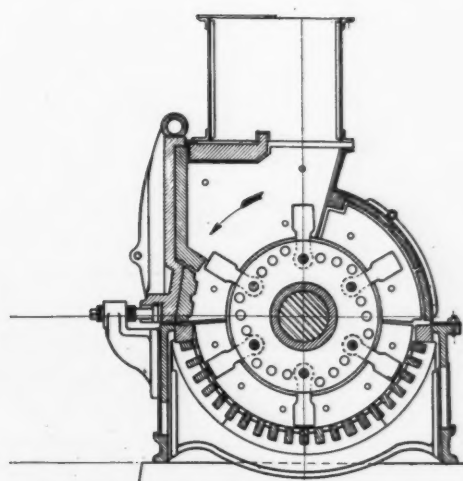
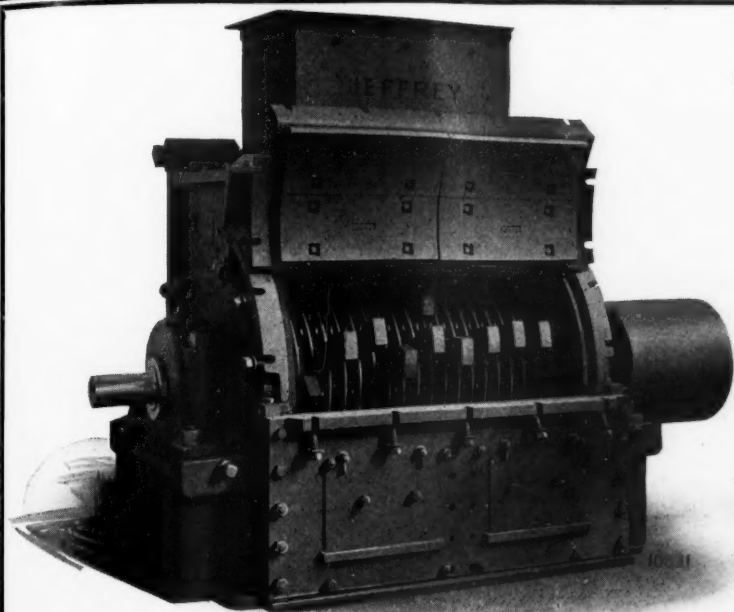
Los Angeles  
San Francisco

Montreal  
Washington, D. C.

# BROWNING

*"The All-Around Champion"*

*Saying, "I saw it in ROCK PRODUCTS," will bring quick action*



Sectional View of Pulverizer showing  
Top Feed

Note: Accessibility, Compactness and Ball Bearings

# Jeffrey <sup>TYPE</sup> "B" Ball Bearing Swing Hammer Pulverizer

for Breakdown of Large Pieces of  
Limestone, Gypsum, Shale, etc.

Leading Cement Mills, Lime Plants, Quarries, Gypsum Plants, etc., are being equipped with Jeffrey Swing Hammer Pulverizers to meet the constantly increasing demands.

*Write for Pulverizer Catalog No. 147-D*

**The Jeffrey Mfg. Co., 935 North Columbus, Ohio**  
Fourth St.

New York  
Boston

Scranton

Philadelphia  
Cleveland

Pittsburgh  
Chicago

St. Louis  
Birmingham

Dallas  
Milwaukee

Seattle  
Denver

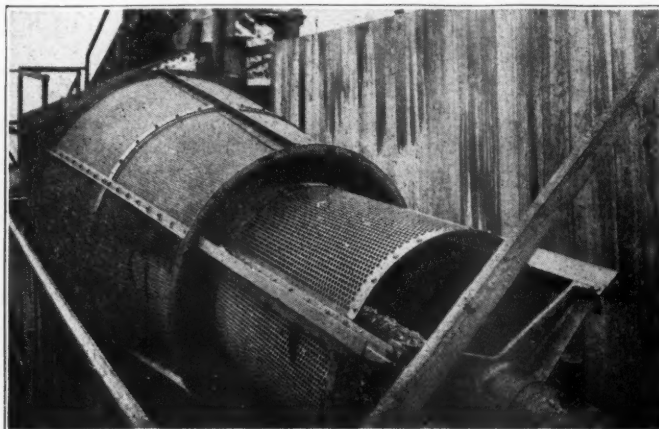
Montreal  
Detroit

*Manufacturers of Pulverizing, Conveying and Elevating Machinery; Chains;  
Self-Propelling Loaders; Electric Trolley and Storage Battery Locomotives, etc.*

*Cooperation is the thing—please mention ROCK PRODUCTS*



The large illustration shows a Webster Cyl-Cone Sand and Gravel Washing Plant at Ludlow, Ky., owned by Ideal Supplies Company.



The Webster Cyl-Cone Screen, shown at left, permits a particularly economical arrangement and construction for a plant to make three or more size separations

## Buy WEBSTER Equipment

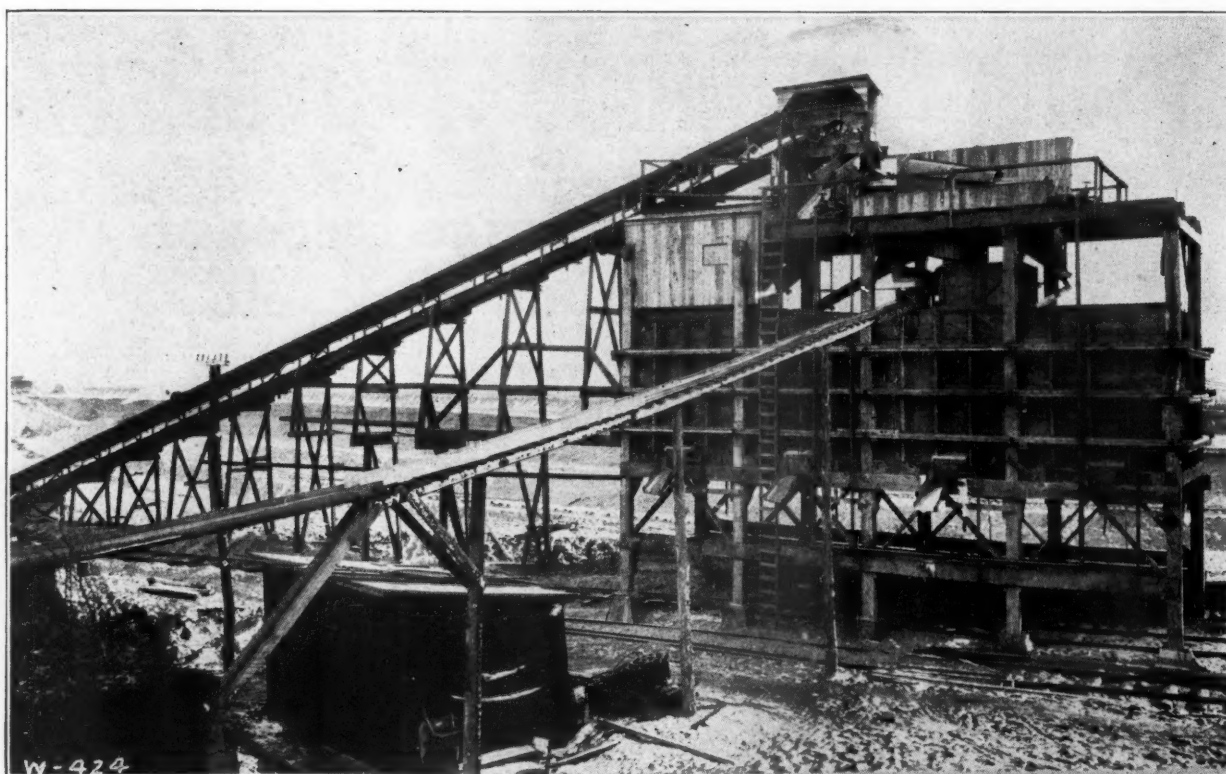
Webster Machinery will help get out more product and will cut the per ton costs of handling.

And because it is staunchly built, and designed intelligently for the work to be performed, it gives the user a maximum benefit

at a minimum maintenance cost.

Since we build nearly every type of Conveying, Elevating and Power Transmission Machinery, we can supply the kind best suited to each specific need.

Catalog and Engineering Recommendations upon Request



**THE WEBSTER M'F'G CO., TIFFIN, OHIO, U. S. A.**  
 New York, 90 West St.    Boston, 114 Milk St.    Union Central Bldg., Cincinnati    McCormick Bldg., Chicago

*For better service say, "I saw it in ROCK PRODUCTS"*

# RE-CRUSHING SERVICE

Producing 50-100 tons hourly of  $\frac{3}{4}$ -inch, 1-inch,  $1\frac{1}{4}$ -inch and  $1\frac{1}{2}$ -inch sizes

The No. 4 Telsmith Reduction Crusher is built to follow a No.  $7\frac{1}{2}$ , No. 8 or No. 9 gyratory or a big jaw crusher (any initial breaker with  $2\frac{1}{2}$ "-4" discharge opening) and re-crush to  $\frac{3}{4}$ "- $1\frac{1}{2}$ " sizes. It is a massive affair with an unbreakable pillar-shaft and a short frame, walled and hooped to withstand enormous strains. This Telsmith machine has a huge open crushing hopper with big receiving areas, a gigantic mushroom-shaped head and a discharge circle about one and one half times the main feed diameter. It feeds by gravity, without hand or mechanical feed regulation. It discharges by gravity from the base of the crusher, without centrifugal action. On account of the reduced weight in rotation, Telsmith is seldom damaged by tramp iron. Power required, 60-70 H. P. Size of feed, up to 7" cubes. Shipping weight, 48,000 lbs.

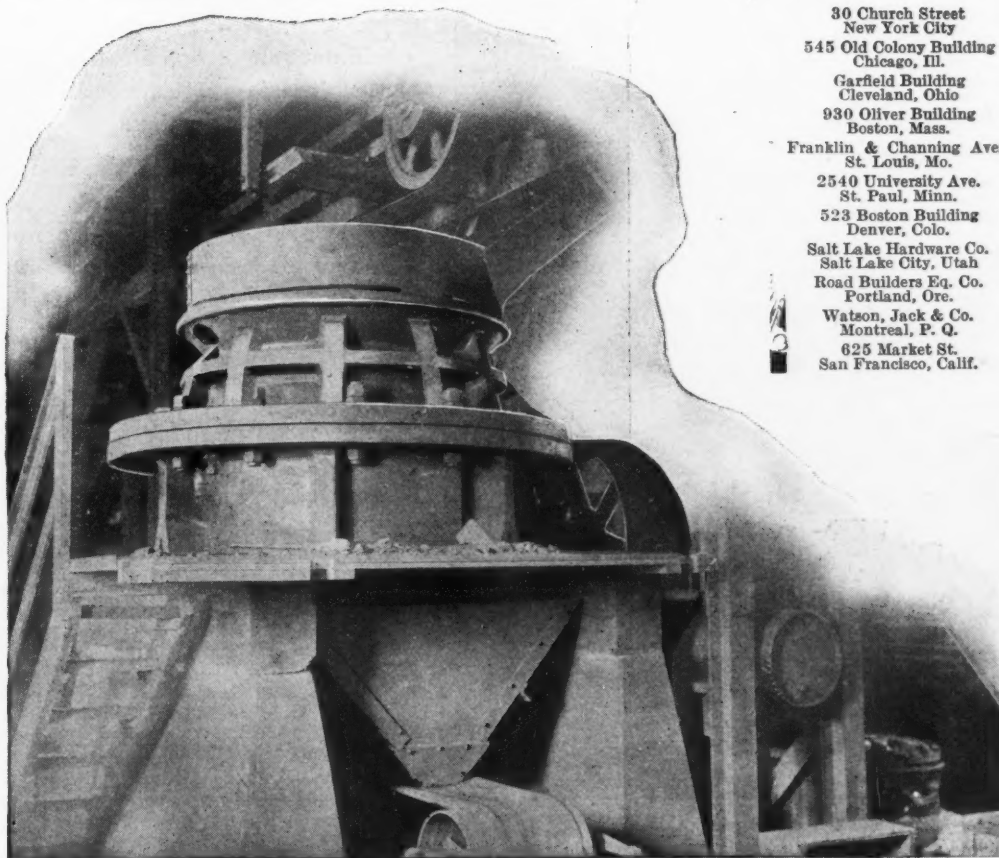
The Telsmith Reduction Crusher is also built in size No. 2, crushing 10-20 tons hourly,  $\frac{1}{2}$ "- $\frac{3}{4}$ " and 1" sizes. Power required, 20 H. P. Size of feed, up to  $4\frac{1}{2}$ ". Shipping weight, 13,600 lbs.

Glad to send you, without obligation, Bulletin No. 4-F-11 (Telsmith Reduction Crushers) and Catalog No. 166 (Telsmith Primary Breakers). Just write for them.

## SMITH ENGINEERING WORKS

3188 Locust Street

Milwaukee, Wisconsin



30 Church Street  
New York City  
545 Old Colony Building  
Chicago, Ill.  
Garfield Building  
Cleveland, Ohio  
930 Oliver Building  
Boston, Mass.  
Franklin & Channing Aves.  
St. Louis, Mo.  
2540 University Ave.  
St. Paul, Minn.  
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For better service say, "I saw it in ROCK PRODUCTS"



"ONE MAN - ONE MINUTE"



# STURTEVANT "OPEN-DOOR" MACHINERY

## "Open-Door" One Man-One Minute Plant

COMPLETE CRUSHING, GRINDING, ELEVATING AND SCREENING PLANTS, FOR HARD OR SOFT MATERIALS.

MACHINES OF STURTEVANT "OPEN-DOOR" CONSTRUCTION.

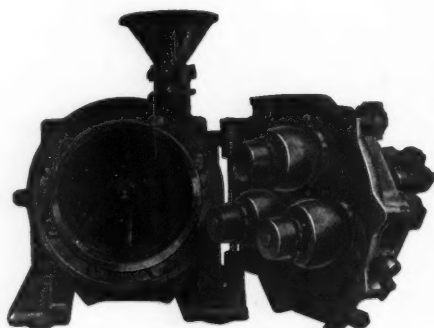
EVERY PART ALMOST INSTANTLY ACCESSIBLE, SO THAT ONE MAN CAN SWING THE EASILY OPENED DOORS AND REACH EVERY PART, FOR INSPECTION, CLEANING, OR REPLACEMENT.



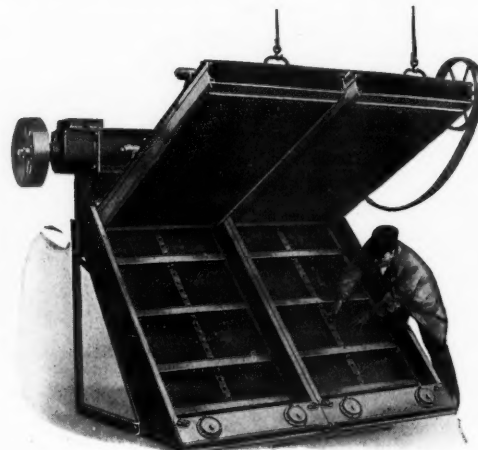
Labor Saving—Owing to the Open Doors one man can do the work of many men in much less time.

Minutes replace hours of valuable time (overtime and Sundays).

Continuous Operation — Production depends upon the amount of time plant is in operation and the condition of the machinery. Quick access means quick repairs and minimum time lost in shut downs.



PATENTED



Ease of getting into machine for adjustment, replacement and inspection without long stops allows you to keep machines in perfect condition, and at maximum production.

Shut downs are costly, non-productive labor and loss of output soon devour profits. Inaccessible machinery has no place in a modern plant.



PURCHASE ALL OF YOUR CRUSHING, GRINDING, SCREENING, CONVEYING, WEIGHING AND MIXING MACHINERY, INCLUDING SPOUTS, CHUTES, HOPPERS, ETC., FROM ONE CONCERN.

WE ARE EXPERTS IN MODERN DESIGNS, AND SPECIALISTS IN THIS TYPE OF MACHINERY.

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**STURTEVANT MILL CO., BOSTON MASS.**  
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INCORPORATED

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This emphatic statement is made to set at rest unfounded rumors regarding the Company's plans. Aetna Explosives Co., Inc., is working with unshaken determination to play the same big part in these days of reconstruction as it did during the days of war.

Nine plants and fourteen branches are devoting the skill and knowledge gained during that struggle to the big job of peace-time needs. This organization is trained to meet the requirements of both the large and the small user of explosives and to satisfactorily serve its customers both old and new.

Aetna Explosives are powerful, dependable, safe. Insist on getting them. If your dealer does not sell them, write us and we will make sure you are promptly served.

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165 Broadway, New York

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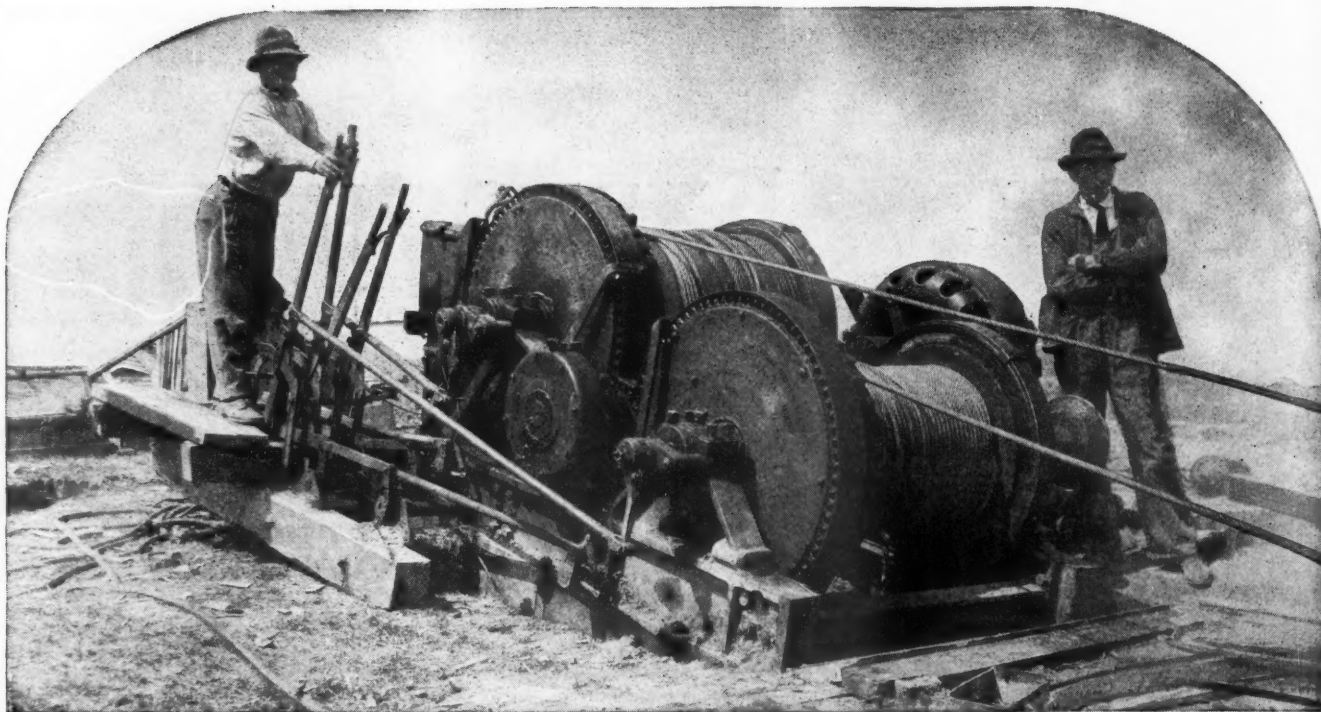
Birmingham, Ala.  
Buffalo, N. Y.  
Chicago, Ill.  
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Joplin, Mo.  
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*Prompt attention will be given your inquiry if you mention ROCK PRODUCTS*



## Stripped off 60-foot clay and gravel overburden for nine-tenths of a cent a yard

*Saved the wages of 32 men*

That's what an "AMERICAN" Electric Hoist is doing for a big brick company. It pulls a big six-yard scraper bucket through tough shale and keeps the plant, which has a daily capacity of 160,000 bricks, supplied with clay.

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**American Hoist & Derrick Co.**

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Builders of "AMERICAN"

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# Atlas Explosives

"A PROPER explosive for every blasting requirement" is provided in the ATLAS line. But—of equal importance to users of explosives—is the SERVICE behind Atlas Explosives.

Each particular explosive differs from every other explosive in strength, velocity, volume, cold resistance, water resistance or other factors. Therefore the Atlas Service Man diagnoses conditions and prescribes the explosives best suited to meet each individual requirement of the user.

We are confident that if you will but utilize this ATLAS service—

*First:* Your blasting will be done more efficiently.

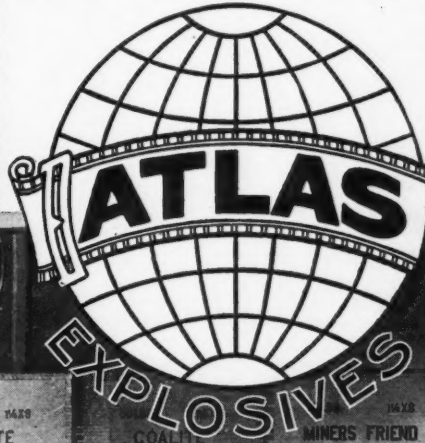
*Second:* Your blasting will be done more economically.

*Third:* You will be glad you put your blasting problems up to us.

Address our home office or the nearest of our branch offices.

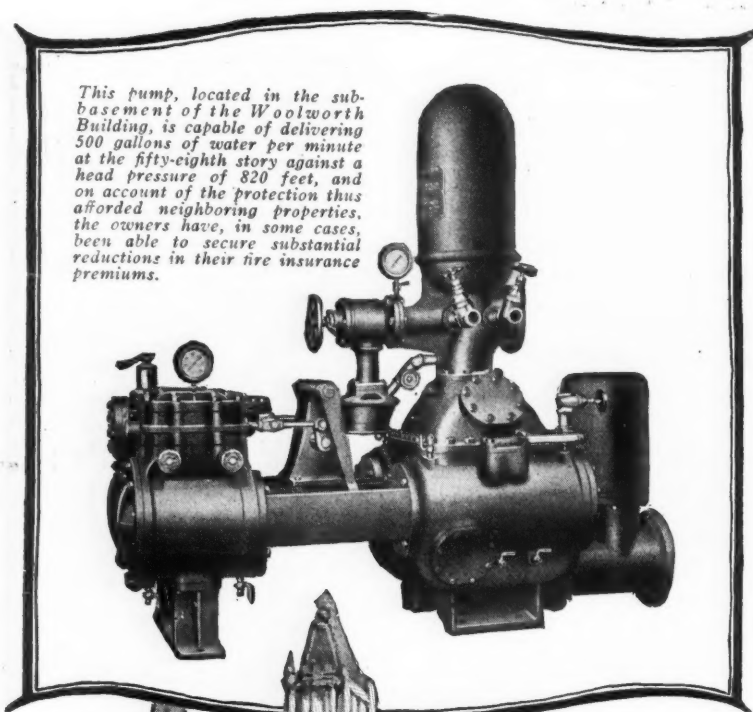
**ATLAS POWDER COMPANY**  
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Branch Offices: Allentown, Pa.; Birmingham, Ala.; Boston; Chicago; Des Moines, Ia.; Houghton, Mich.; Joplin, Mo.; Kansas City; Knoxville; McAlester, Okla.; Memphis; Nashville; New Orleans; New York; Philadelphia; Pittsburg, Kans.; Pittsburgh, Pa.; Pottsville, Pa.; St. Louis; Wilkes-Barre, Pa.



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**When the world's highest building is in danger—Worthington Pumps protect it**

More than 700 feet above the street, yet the fifty-eighth floor is as fire-safe as the first.

The Woolworth Building, the Metropolitan Tower, the Municipal Building—engineering achievements of world-wide fame—all depend on Worthington equipment for both fire protection and general service.

It is a significant fact that throughout New York, where property values demand the most infallible protection, and where conditions of service are most severe, there is a decided preference for Worthington equipment.

**WORTHINGTON PUMP AND MACHINERY CORPORATION**

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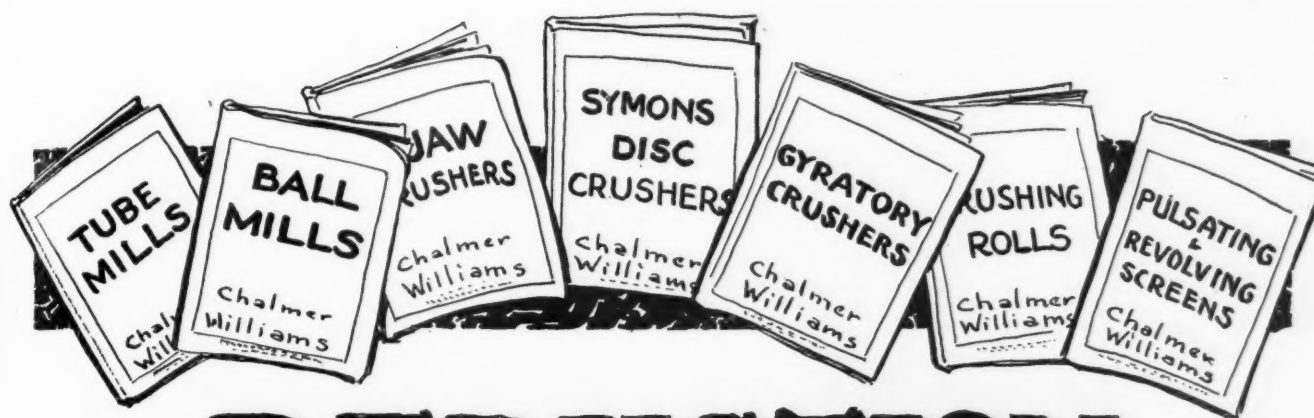
# WORTHINGTON



Worthington Works, Harrison, N. J.  
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Saying, "I saw it in ROCK PRODUCTS," will bring quick action



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Gyratory and Jaw  
Crushers for Initial  
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we want the opportu-  
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in a position to go into  
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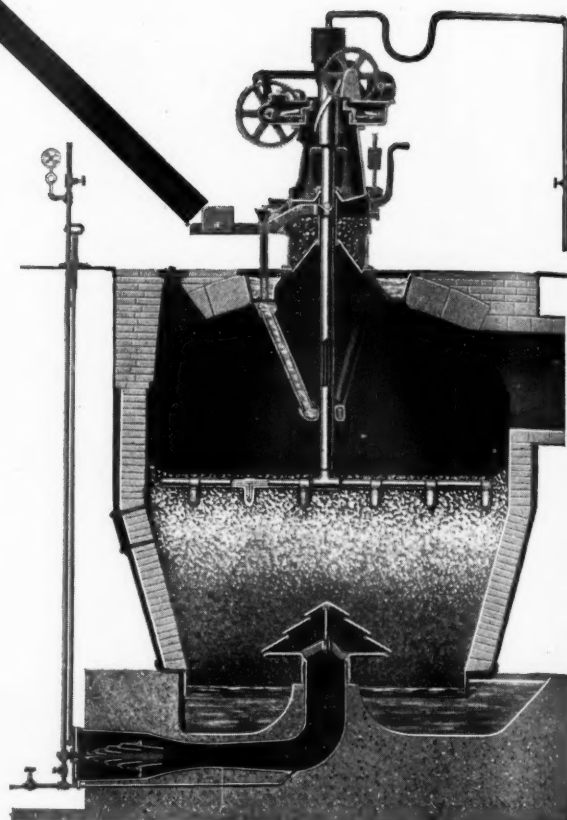
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*Cooperation is the thing—please mention ROCK PRODUCTS*

## Make Your Kilns Produce More Lime

Lime manufacturers realize that they are facing an unprecedented demand for their product. All indications point toward a gigantic construction program for the coming year—a construction program which can not be carried out unless lime manufacturers produce more lime.

Several of the larger manufacturers have already increased their output by installing



## Chapman Floating Agitators

on their hand-poked Gas Producers. They find the capacity of their producers is doubled, and that a constant quantity and quality of gas is delivered to the kilns. Every practical lime man knows that the uniform temperature thus made possible, means a greater production of lime.

We are also prepared to handle complete Gas Producer installations. Our force of experienced engineers are glad to give the lime producer any information on the application of producer gas.

**Let us solve your fuel problems**

**CHAPMAN ENGINEERING CO.**

**Mt. Vernon, Ohio**

**11 Broadway, New York**

**Oliver Bldg., Pittsburgh, Pa.**

*For better service say, "I saw it in ROCK PRODUCTS"*



The Larger and More Difficult the Problem,  
the More Certain it is That the  
Correct Solution is Found in

# S-A EQUIPMENT



New Hudson, Mich., plant of the United Fuel & Supply Co., Detroit, Mich.

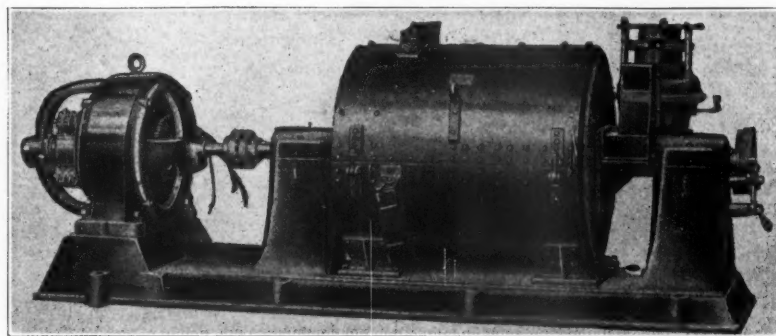
That S-A Equipment responds to this call is evidenced by the fact that the new plant of The United Fuel and Supply Co., Detroit, Michigan, described on page 26 of this issue of Rock Products is S-A Equipment throughout. This is only one of the many instances where S-A Equipment proved to be the most logical choice for high grade material in uninterrupted, economical performances. We maintain a force of engineers whose business is solely of advising and planning equipment best suited to particular projects. Our engineers are always at your service to furnish you the necessary information in all such installations.

**Stephens-Adamson Manufacturing Co.**  
Aurora, Illinois

*The advertiser wants to know that you saw his ad in ROCK PRODUCTS*

# Pulverized Coal

For Calcining Lime, Cement, Gypsum, Magnesite, Dolomite; for Drying Phosphate Rock, Humus, Tankage, Clays, etc.



## The Accomplishment of Pulverized Fuel Combustion

requires the coal to be ground to a fine powder and that the powder be thoroughly mixed with the air and delivered to the furnace. The apparatus for the accomplishment of these requirements must therefore include a pulverizer, an air blast, means for handling both pulverized coal and air and a burner in which both coal and air are under control and in which they are thoroughly mixed. These are all incorporated in a single machine in

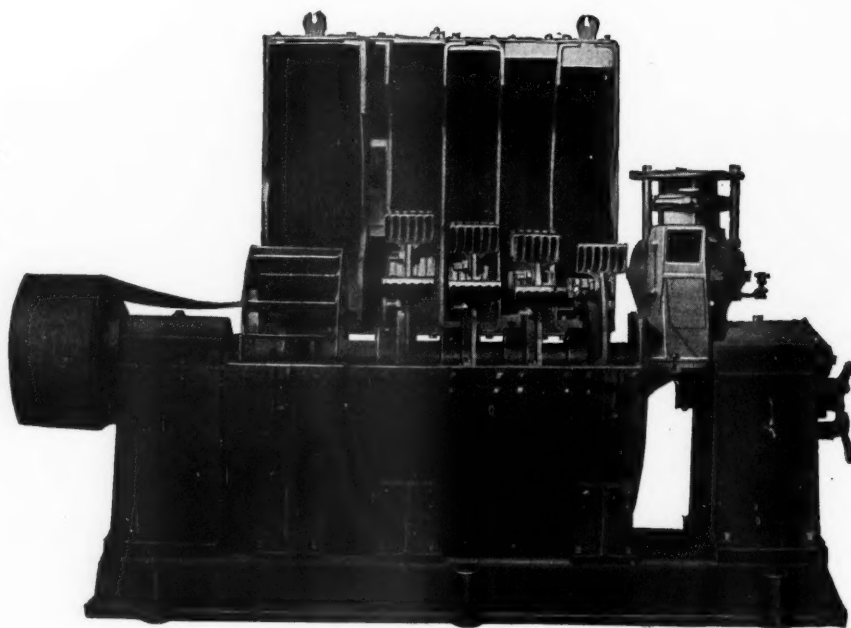
### The Aero Pulverizer

#### *The Unit System*

Built in five standard sizes ranging in capacity from 600 lbs. to 5000 lbs. of coal per hour; is dust proof; is strongly built and arranged for easy access to parts susceptible to wear.

Write for Bulletins 26 and 27

**The Aero  
Pulverizer Co.**  
Room 1441, 120 Broadway  
New York



*You will get entire satisfaction if you mention ROCK PRODUCTS*

# Rock Products

Vol. XXII

Chicago, December 6, 1919

No. 25

## Lime and Cement Manufacture and Coal

Many Possibilities in Fuel Saving Emphasized by Present Situation and the Prospect of Much Higher Prices for Coal in the Future

SOMEWHERE in the neighborhood of 175,000,000 tons of bituminous coal is used annually for industrial purposes in this country, exclusive of the railways, coke ovens, gas plants and electric railway and power plants. Of this amount probably about 10,000,000 to 11,000,000 tons, or 6 to 7 per cent of the total, is required for the manufacture of lime and cement—10,000,000 tons for cement and about 1,000,000 tons for lime.

It was pointed out in the conclusion of the article describing the waste-heat recovery methods at the Louisville Cement Co.'s plant, in ROCK PRODUCTS of November 22, that it would be possible to cut coal consumption in the cement industry nearly in half if all cement plants were operated by the same method and produced their own power from waste heat. Of course, many buy electrical power and will continue to do so until the price of coal reaches a point where the investment in waste-heat utilization equipment will justify the additional investment in their own power plant. But the possibility of fuel saving is there and sooner or later must be realized, because our coal fuel resources are very far from being inexhaustible.

In the case of lime manufacture the usual coal fuel ratio is about 4 lbs. of lime to 1 lb. of coal. A ratio of  $6\frac{1}{2}$  lbs. of lime to a pound of good bituminous coal is a possibility. A ratio of  $5\frac{1}{2}$  lbs. of lime to a pound of coal ought to be easily practicable, if the same amount of brains and energy is put into the solution of operating

problems in the lime industry as has been put in power plant operation.

It is indeed practicable now by the use of a properly designed and operated gas producer. If the annual production of 4,000,000 tons of lime could be accomplished with a  $5\frac{1}{2}$ -to-1 ratio the saving in coal would be at least 250,000 tons per year. Of course a few lime plants still burn wood, but a great many do not get as good a ratio as 4 to 1, so that the estimate is not far off.

The saving of 4,250,000 tons of coal a year in the cement and lime industries would not mean merely the saving of the price of the coal—some \$15,000,000, but it means an immense saving in the costs of operation through not having to handle, store, pulverize and burn this unnecessary excess of fuel. The railways would be saved haulage on at least 100,000 carloads and all the incidental work connected with these shipments.

It is true, probably, that the chief tendency of the past has been to over-produce coal and consequently the net result was to encourage its waste. Within the last year or two the coal operators have become pretty well organized to prevent over-production and its attendant evils, and it is likely that these efforts will continue in the coal industry as in every other organized industry. Such efforts may yet have governmental sanction. There are, moreover, many other considerations which will limit the coal supply of the future, as explained by Dr. H. M. Chance on another page of this issue.



# Winter Operation of Sand and Gravel Plant

Granite Sand and Gravel Co., Indianapolis, Ind., Will Prepare All Winter for 1920 Business—Under-water Storage a Special Feature

FRIENDS of W. K. and George V. Miller of the Granite Sand and Gravel Co., Indianapolis, Ind., will not be surprised to learn that they have introduced an innovation in the sand and gravel business, which may be far-reaching in results. These operators have never been known to be satisfied with present results and methods, and their present development is of unusual interest.

## Combination of Dredge, Barge and Drag-line Operation

The essentials of the Granite Sand and Gravel Co.'s operation are shown in the plan below, for which Rock PRODUCTS is indebted to the Sauerman Bros. Chicago, Ill., who made the cableway bucket-excavator installation. For the removal

of the sand and gravel from the bank or deposit a floating barge with a clam-shell bucket, or a hydraulic dredge, is used.

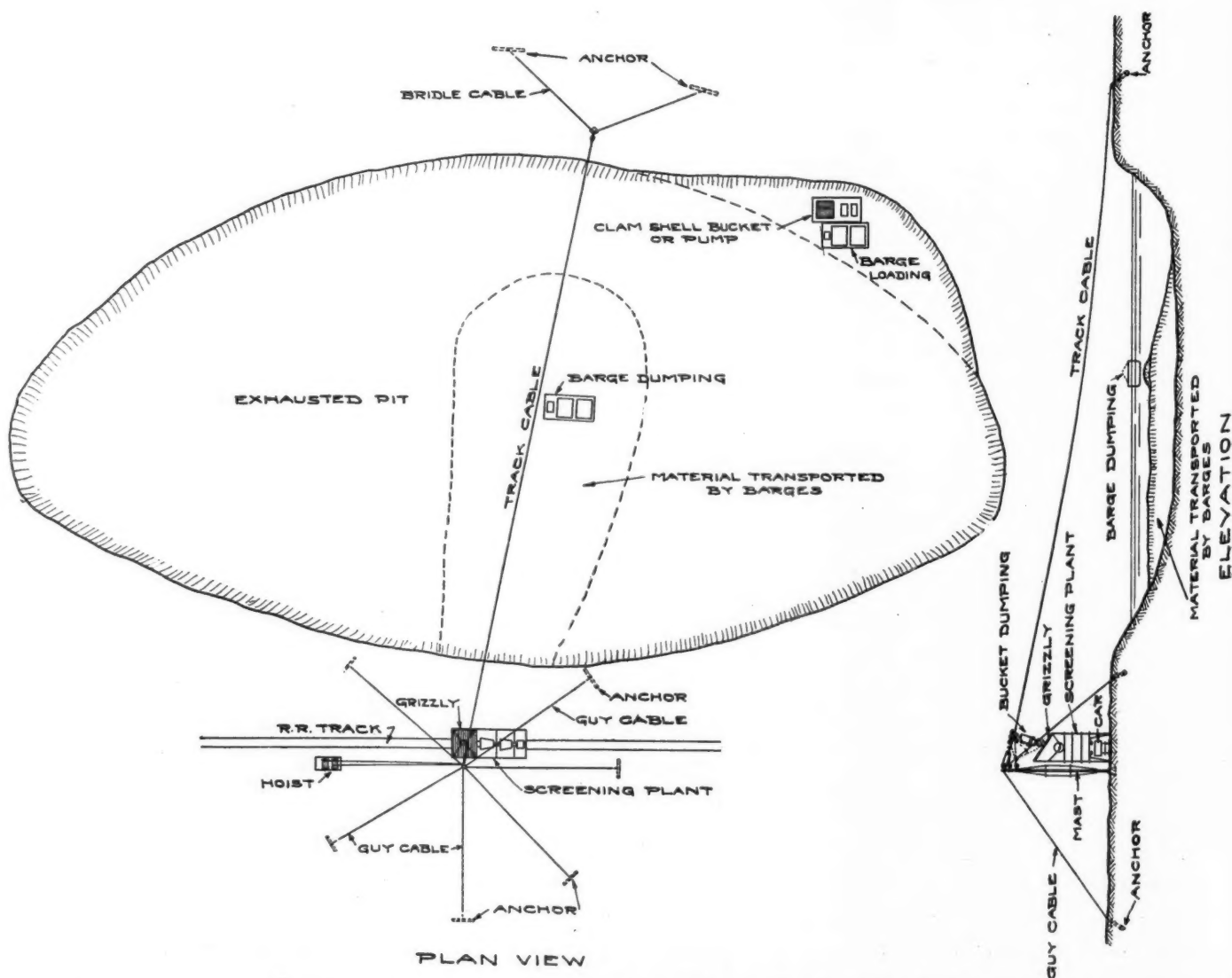
The dredged material is loaded on a bottom-dumping 60-cu. yd. barge of the Millers' own design. (In the near future these barges will probably be built of concrete.) This barge is self-propelling by means of a gasoline engine and one man can navigate it from the dredge to and from the dumping point in the excavated gravel pit, where the material is dumped on a storage pile, the top of which must of necessity be enough below water to permit the barge to navigate.

From this under-water storage pile the sand and gravel is recovered and conveyed to the washing and screening plant

by a 2-yd. drag-scraper bucket, operated from a cableway. Thus it will be possible to operate the dredge and barge the greater part of the winter, while there will probably be many days in which the whole plant may be operated by use of the stored material, which can not freeze up.

The pit has been excavated to a depth of about 40 ft. below the water level. The barge discharges at the end of the pit nearest the plant so that the average haul for the scraper bucket at no time exceeds 300 ft., which makes it possible for the bucket to make the round trip in about two minutes.

The edges of the pit are about 20 ft. above water level. In operating the dredge no stripping is done as the two

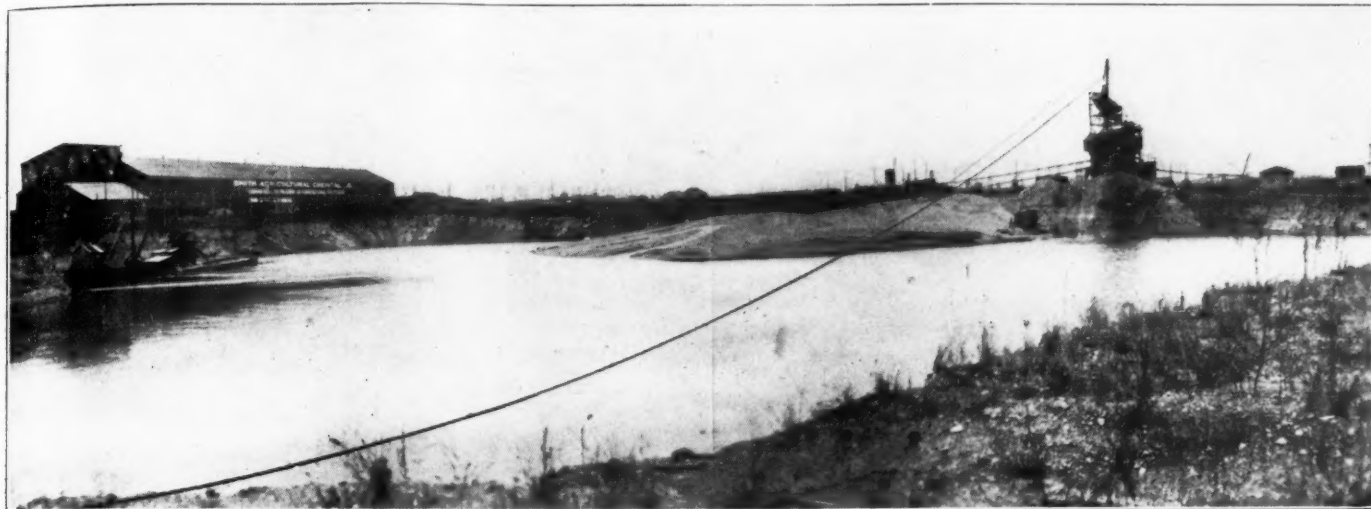


Plan of operations of the Granite Sand and Gravel Co., Indianapolis, Ind.

to four feet of overburden is allowed to by gravity screens on board the dredge. fall into the pit, where it is pretty thor-This material will be stored elsewhere in oughly washed out in the dredging, barg- the pit and may be reclaimed direct into ing, and recovery operations. If the ma-railway cars for shipment as "concrete terial is unusually dirty it can be washed mix" by means of a second cableway

excavator, which will soon be erected.

The cost of rehandling the material is about compensated for in the abolition of stripping, which formerly cost about \$2,500 per acre.



View of pit of the Granite Sand and Gravel Co., Indianapolis, Ind.

### Indiana Highway Authorities Cannot Purchase Aggregates

**I**NQUIRY has been made by the Indiana Sand and Gravel Producers' Association relative to the possibility of the State Highway Commission and the County Commissioners of each county advancing money to contractors for stored road building material. The Chief Engineer of the Highway Commission says that the law does not permit either State or Federal money to be used for such purpose. The State Board of Accounts has informed the Association that it will not permit Commissioners to render such financial assistance. Therefore, the producers and contractors must plan to extend the season of production and delivery on other financial resources, unless the Legislature at the special session (if any) this winter can be induced to give relief.

### President Opposes Federal Highway Commission

**P**RESIDENT WILSON did the good roads movement the honor of special mention in his annual message to congress. By implication he has gone definitely on record as opposed to the Townsend bill creating a new federal highway commission to supplant the U. S. Bureau of Public Roads of the Department of Agriculture.

The President writes: "I would urge also the continuance of federal participation in the building of good roads, under the terms of existing law and under the direction of present agencies." Which means he must be against the Senate bill.

### Indiana Gravel Men Adopt Slogan "Service"

**T**HE QUESTION OF SPECIFICATIONS are constantly before us and will be next year more than ever before. Inspection by State and Federal Governments will tend to unify the methods over the State and demand more strict interpretation. It is the desire of every producer that his material shall fit exactly the purpose for which it is made. Many specifications that have been written and are now used in this State and elsewhere do not convey the intent of the writer of the specifications. It is important that you see your local engineer and be sure that his description of materials required will include that which may be obtained from your deposit. Also, that the specifications be such as will permit the normal operation of your plant. We must live up to our slogan, "Better Service," and each take an interest in seeing that the materials used are the best that can be economically produced.—News Letter of the Indiana Sand and Gravel Producers Association.

### Federal Highway Commission Issue Soon Coming Up

**W**ASHINGTON, D. C.—Hearings on the Townsend Federal Highway Bill will probably be heard late in December, according to plans now being made, it being intended to bring this measure up in the Senate as soon as the urgent questions now before that body are disposed of.

As soon as possible after the reconvening of Congress, however, the committee on post offices and post roads will take the measure up.

### Illinois Leads in Meeting Roadbuilding Issue

**O**FFICIAL ANNOUNCEMENT has been made by Superintendent Bradt, of the Illinois State Highway Department, of arrangement under which the Department has decided to pay for such materials as sand, gravel and crushed stone, delivered on the work in advance of construction. This is a form of co-operative assistance that has not been authorized yet in any other state, and should go a long way towards relieving the car situation and distributing the demand for materials over the entire producing season.

### Chicago Breaks Record in Building Activity

**P**ERMITS FOR THE CONSTRUCTION of buildings to cost \$90,000,000 have been issued by the Chicago city building department thus far this year.

Edward W. Nordlie, chief building inspector, estimated December 1 that in spite of the high cost of material and the building strike last summer this year's permits will surpass in the value of the buildings to be constructed those of 1916, when \$113,000,000 worth of permits were issued. Nineteen sixteen was the largest year the department has seen.

In the last month permits were issued for 167 stores and factories, 527 residences and 38 apartment buildings. Other permits brought the cost of the buildings to be constructed up to \$17,577,000. For October the figure was \$16,948,000; for September, \$13,483,000, and for August \$4,960,400.

# The United Fuel & Supply Co., of Detroit, Completes Eighth Gravel Plant

Michigan's Largest Building Supply Dealer Also Largest Sand and Gravel Producer

IT IS COMMON PRACTICE for the building supply dealers of the big cities to produce their own sand and gravel, but the United Fuel & Supply Co., Detroit, Mich., probably holds a record as one of the largest producers in the country.

This company has recently completed at New Hudson, Mich., its eighth plant. This was constructed during the war and is now in operation, ready for the busy period, which is promised by the recent \$50,000,000 state highway bond election.

The New Hudson plant is modeled closely after the same company's plant at Oxford, Mich., which has a number of features different from the ordinary run of sand and gravel plants.

The main difference between these two plants is that the new Hudson plant is much more compact. The powerhouse, the crushing plant and the screening tower are close together.

## Operating Features

The material is excavated with a drag-line excavator operated from a structural steel mast 125 ft. high. The drag-line bucket discharges to a large storage pile over a concrete tunnel. Provision for an extra large storage pile over the tunnel was made to provide material to keep the plant operating if the drag-line should be out of commission for any reason.

The raw material is fed from the storage pile to a 36-in. belt conveyor through a series of duplex cut-off gates. The inclined conveyor is 165 ft. long between pulley centers. The material is discharged by it into a 54-in. x 18-ft. cylindrical scalping screen.

The screen rejections or over-size are chuted to a 48-in. disk crusher. The crusher discharge is fed back to the main belt conveyor by a 24-in. wide by 140-ft. long belt conveyor.

The material passing the scalping screen drops into a hopper. Under this hopper is a 36x50-in. apron feeder which delivers the material to a 36-in. belt conveyor, 215 ft. between centers. This conveyor has its axis at right angles to the axis of the other 36-in. conveyor.

## Sizing Screens and Bins

From the top of the conveyor the material is chuted to two batteries of four 72-in. Gilbert screens each. Provision

is made for doubling this screening capacity.

These screens are mounted differently from the general run of plants, where they are set in series over the bins on parallel shafts. At the New Hudson plant (also the Oxford plant) the screens are set end to end in pairs at right angles to these chutes feeding them.

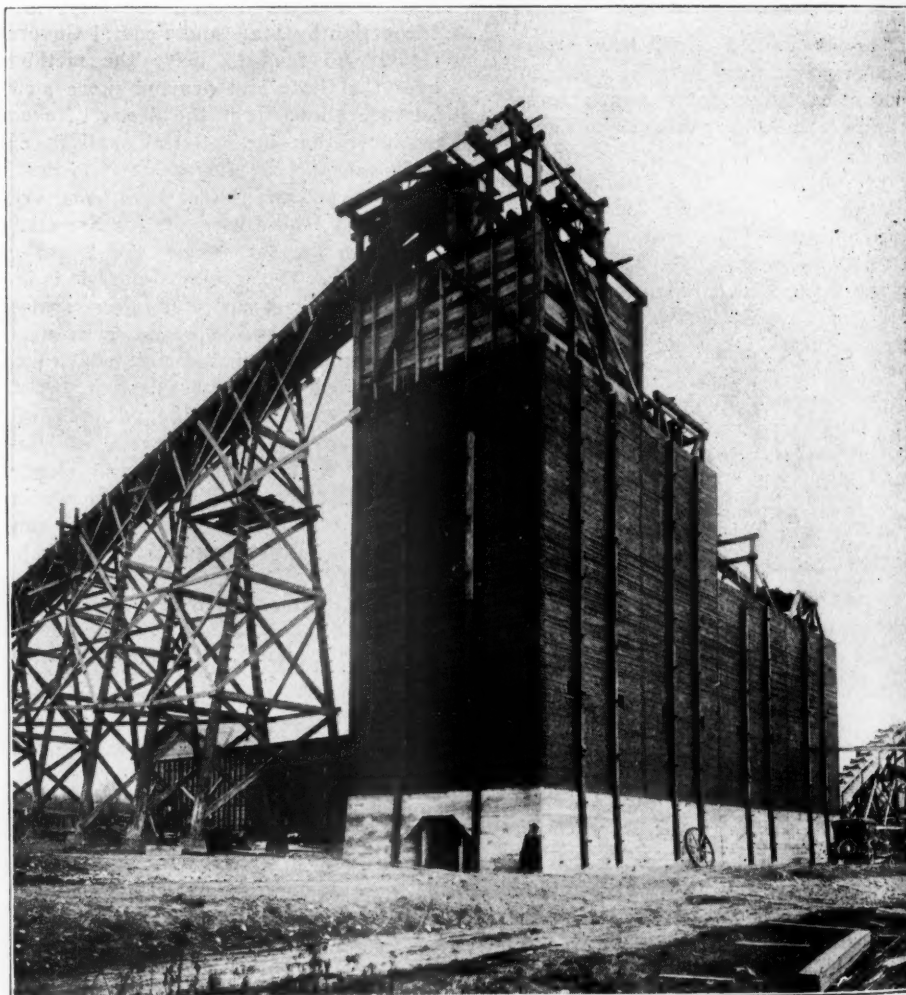
The advantages claimed for this method of arranging the screens is economy in head-room and a better layout for the driving mechanism. The deflection of the flow of material in entering the screens, it is also claimed, helps to wash and clean it. The flow of material to the screens is kept uniform by means of a steel pan feeder.

Sand is recovered by means of four settling tanks of the automatic tipping variety.

Bin storage is provided for about 500

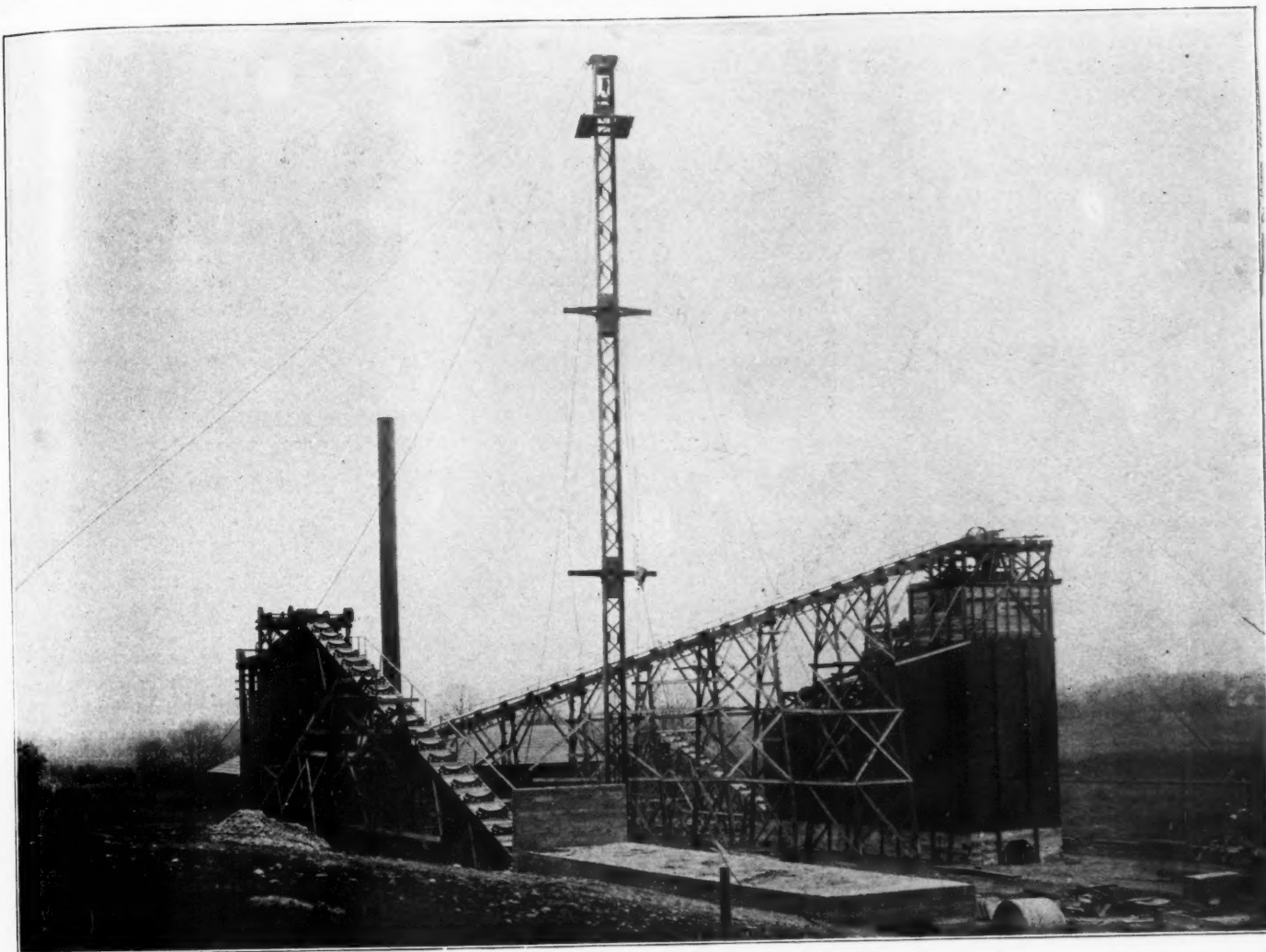
tons of washed material. The bins are equipped with side-loading bin gates. At first the company undertook to store gravel in these bins for a winter supply, but the material froze so solid that when needed it could not be obtained. These bins are used in time of car shortage, or to store a surplus of one size, when orders for another grade are out of proportion.

Provision is made for supplying concrete aggregate in properly mixed proportions by means of nine duplex cut-off gates in the bottoms of the finished-material bins. These gates feed to a 36-in. belt conveyor in a 170-ft. concrete tunnel under the bins. This conveyor discharges into a two-way hopper-bottom mixing bin. The mixing bin is provided with discharge spouts to cars on either side.



Construction view of the new Hudson plant





New Hudson, Mich., plant of the United Fuel & Supply Co., Detroit, Mich.



Oxford, Mich., plant, showing how material is handled from the drag-line hopper to cars

### Power Plant

The plant has its own power facilities, consisting of two 200-h. p. boilers, one 250-h. p. steam engine for driving the plant and one 100-h. p. hoisting engine for operating the drag-line excavator.

Since there is no future possibility of electrifying this plant, the steam installation was made as complete and economical as possible. It is believed by this company, that where steam is to be used, the most efficient practice is to use one large engine in preference to several smaller ones.

Water is supplied from a well under the engine-room by means of a large vertical, reciprocating pump, driven off



Belt conveyor fed from underneath concrete tunnel



Tunnel conveyor to loading hopper

of the crankshaft of the main engine. It has a capacity of 2,000 g. p. m., and is found to be very satisfactory, for it is always running when the main engine is operating.

All conveyors, screens, feeders, etc., are driven by a manila-rope transmission system, the main shaft pulley having six ropes. If the ropes are properly cared for it is found that they will stand the weather from two to three years.

### Company Organization

The United Fuel & Supply Co., has divided its organization into several distinct departments, each of which is managed separately from the other. Such departments are, sand and gravel plants, marine operation, distribution, and the central office department, which takes charge of cost accounts, credits, purchasing, sales, promotional work and advertising.

### Department of Sand and Gravel Pits

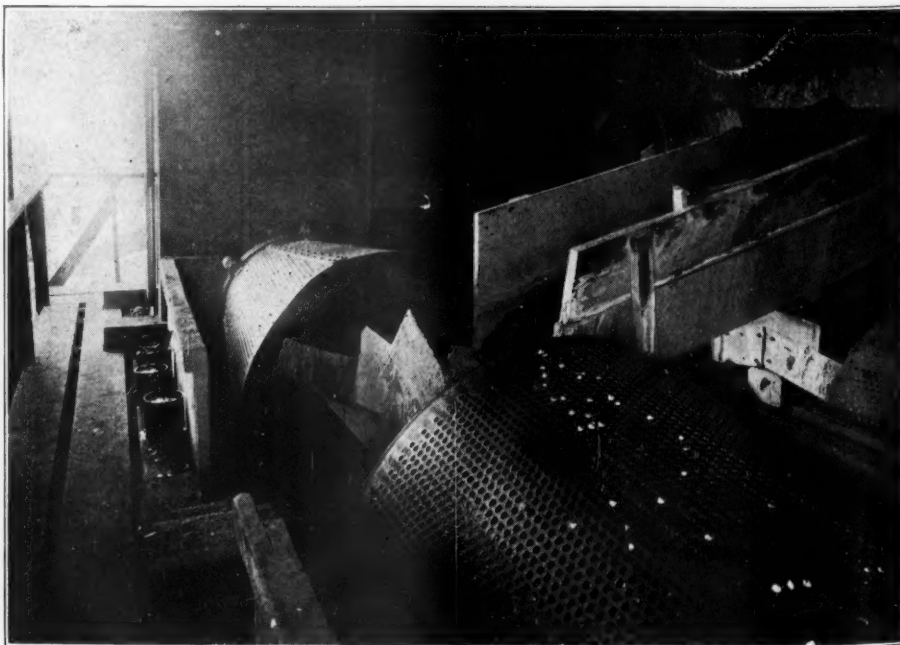
At present the company is taking the

output of ten gravel plants, eight of which it owns. Two are large washing plants of some thirty to forty cars capacity per day. The other eight are semi-portable dry-screen plants, of eight to twelve cars capacity per day. G. A. Seivour is manager of pits and has charge of their operation and repair.

In order to successfully oversee ten plants, the following system is used. The work is divided into operation and repair. A superintendent of pits makes the circuit of the plants and oversees their operation, reporting their condition at the end of each day. A master mechanic has charge of the machine shop at Oxford, Mich., and also makes the circuit of the plants to care for the machinery.

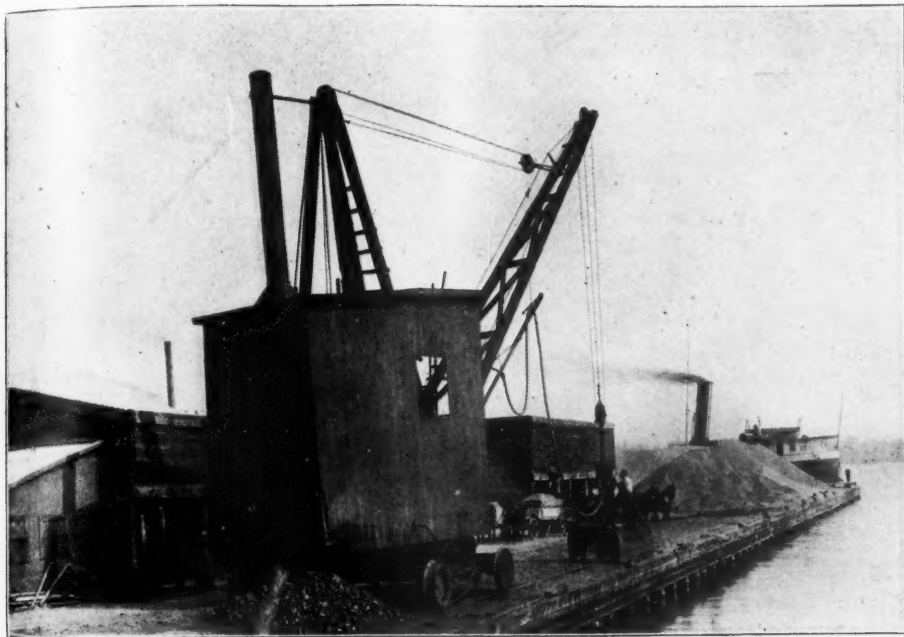
### Making Repairs

In the event that a plant needs repairs, it is noted by the master mechanic, or is reported to him, and he makes the repairs; charging the plant with time and material used. These charges are entered against the plant at the main office.



Material enters screens at right-angles to flow





Steam crane at dock to handle material from boats to loading chutes



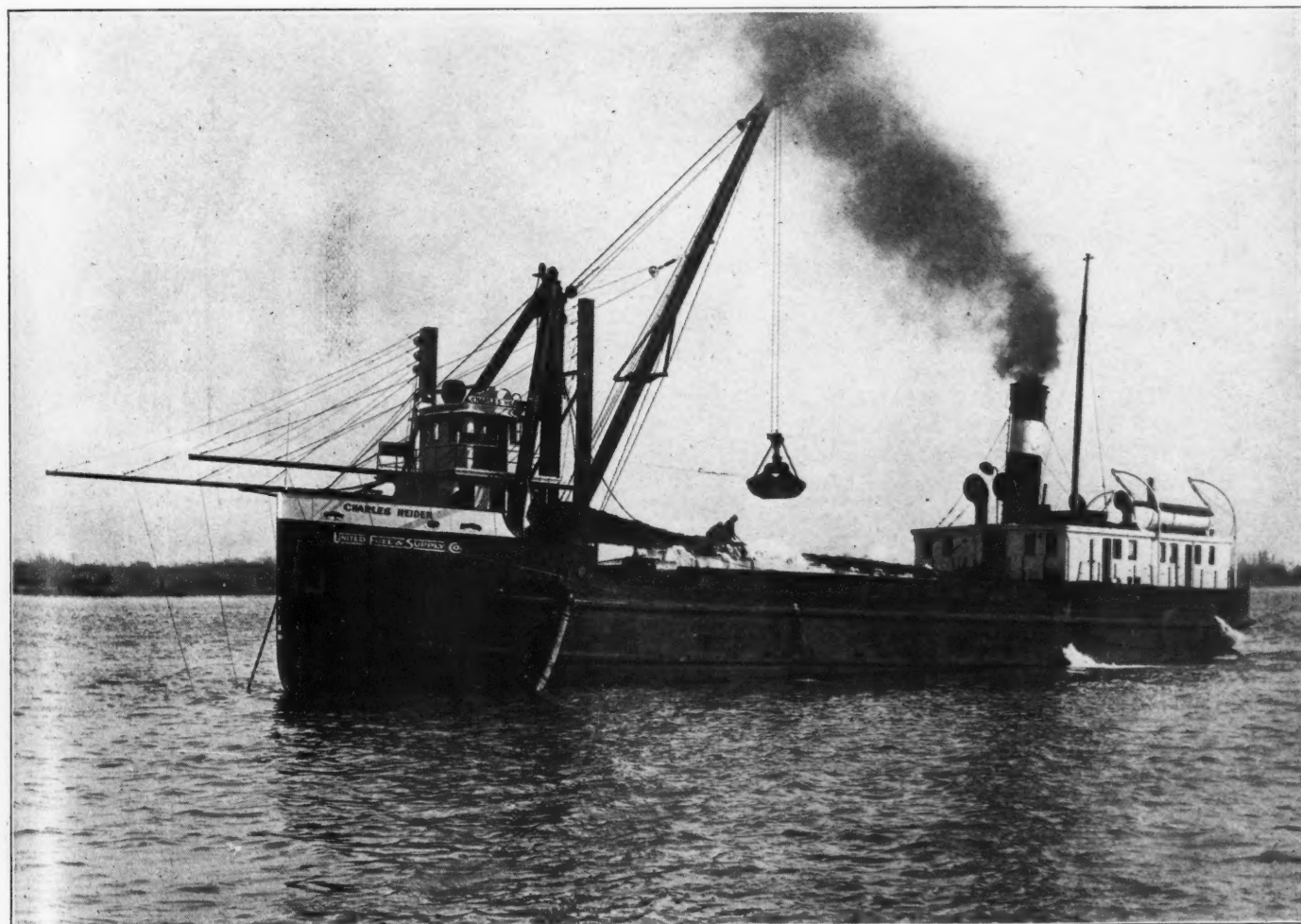
Barge unloading at dock

If it is necessary to make new parts or machine old parts, this is done at the company's machine shop and storeroom at Oxford, Mich. The machine shop, several views of which are shown, is

one of the newest things in the organization. It is very complete in every sense and has for its equipment a planer, three lathes, an acetylene outfit, three drill-presses, a power-driven saw, a centering

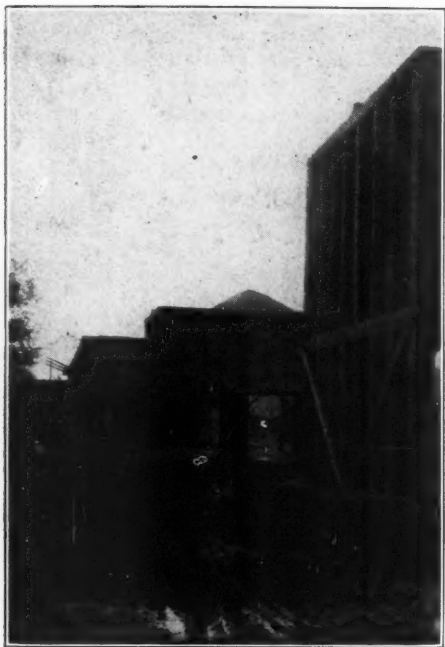
machine, a grinder and a universal wood-working machine.

Mechanics are employed to make patterns and core-boxes; the casting being done at a foundry at Pontiac. The rough

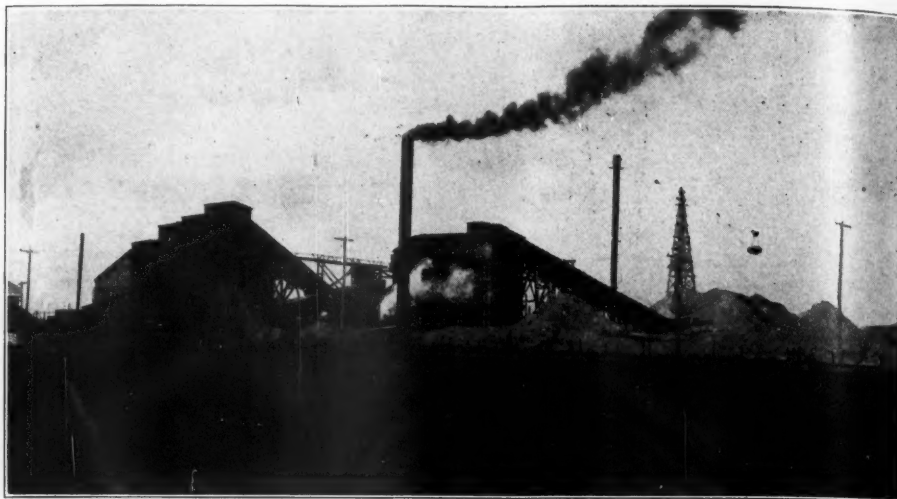


Modern all-steel combination pumping and clamshell loading gravel barge





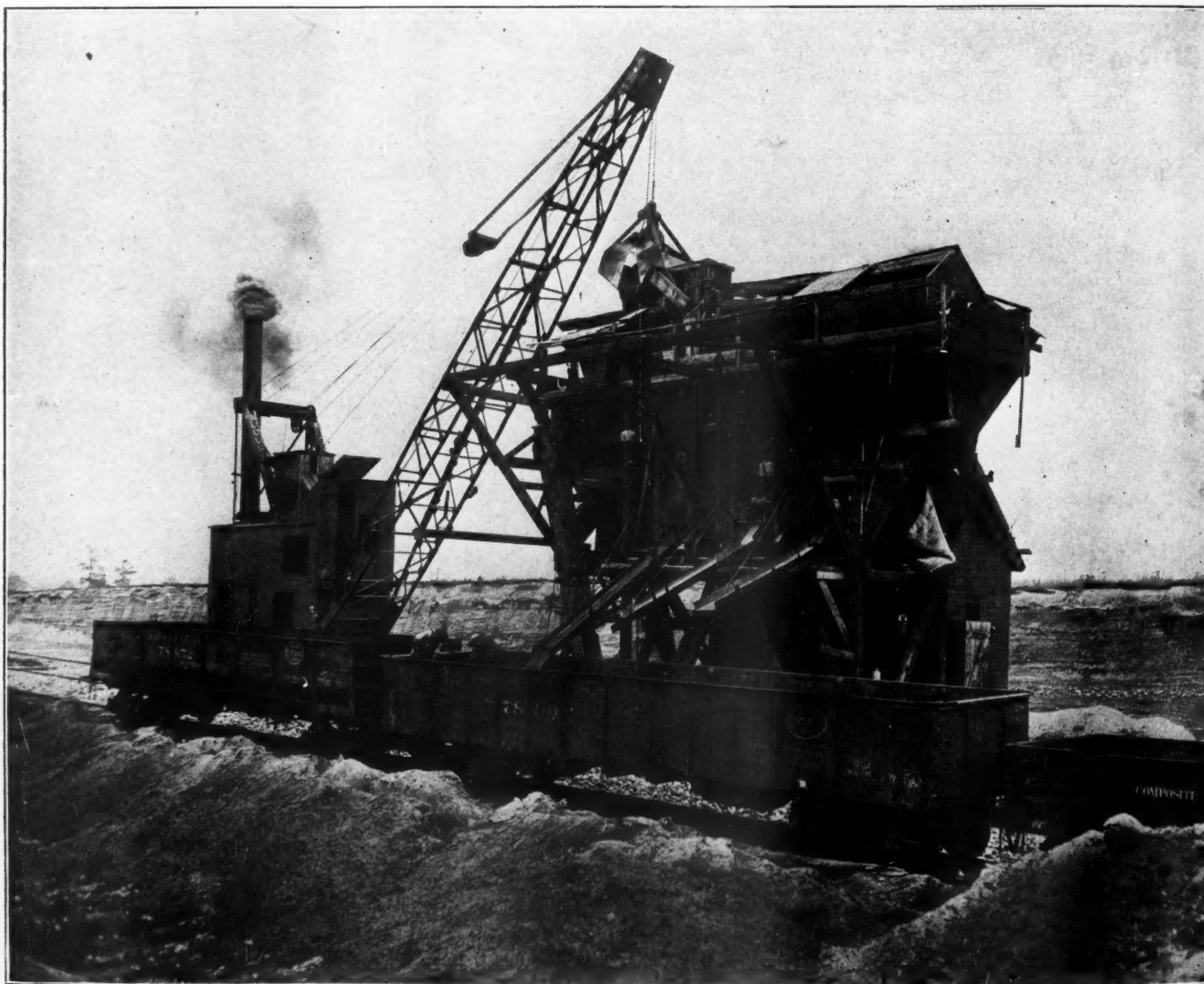
Loading chutes at inland yard



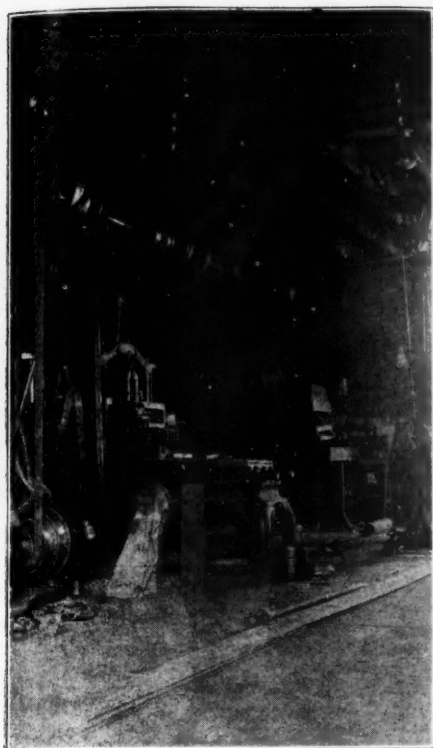
Oxford, Mich., plant, showing dragline and tunnel storage pile

castings are returned and finished at the shop. Besides doing all of the company's work, the shop is kept busy during spare time by job work for other plants or companies in the neighborhood.

The shop is on a self-sustaining basis—that is, it is operated so that the company can tell whether there is sufficient work to justify maintaining such a large shop. All purchases are made through the purchasing agent at the main office,



Semi-portable dry screening plant with trunnion screens to make material from  $\frac{1}{8}$  to  $1\frac{1}{2}$ -inch mesh



Interior of machine shops, Oxford, Mich.

and when a shipment of steel is sent to the shop, it is charged with that material.

In turn, when the shop does a piece of work for a plant, it is credited with the amount of material used, the time put in on the job, plus ten per cent for overhead expense. In this manner, a check is kept on material, and the repairs are charged against the plant, while the machine shop is credited with jobs completed.

The men take pride in this system and feel that when they have completed a piece of work in good time, they have made their department stand out.

Daily reports are made upon the operation of each plant. The office man of each plant sends in a blank form which shows the proportioning of the day's work, the repairs and the amounts and kinds of materials produced. These are all sent to the cost accounting department which works out a report to show the expense of operation. Repairs are prorated over the entire month.

At the end of each month, statements are made which show the cost per ton of operating the various machines, of labor charge, of repair, and of fuel, etc.

#### The Credit and Order Department

The credit and order department come into play when an order is received. Orders are received either at the office or at the plants and as soon as received they are telephoned to the order department. Here a large board shows the credit standing of the customers by colors, and if a man's credit shows up all right the order is given a number

such as 1,684-K, which means that the order is No. 1,684 and that order clerk K says that the man's credit is O. K. In event the credit does not show up good, the order clerk sends it to the credit department, where action is taken. In this manner, it is impossible for a firm with bad credit to get an order.

Most of the plants ship direct to customers by car, unless there are insufficient orders to keep them going, and then the material is shipped to one of the city yards for storage or city distribution. Each day the pits call the office to tell the conditions of pit and plant, so that the office knows just how the pits are able to handle new orders which may come in during the day.

#### The Marine Department

The second and equally as large a source of sand and gravel is from the lake and river. The company owns five river front yards or docks in addition to its inland yards, and ten lake gravel boats of from 350 to 600 cu. yds. capacity each. These boats make a round trip in from 48 to 72 hours, depending upon the material they are sent after. Mr. Williams, a mechanical engineer by profession, with wide experience of things nautical, has charge of the marine department.

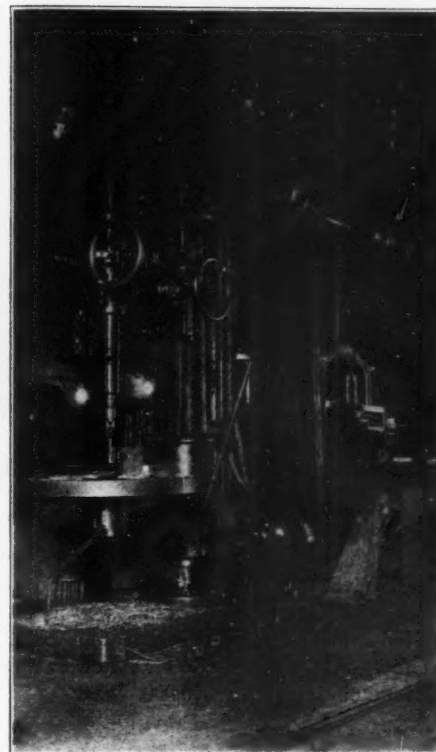
In his department and under his supervision, there is the marine repair shop, the engineering department, the marine dispatch headquarters, the commissary department, as well as the dock yards. The fleet captain makes the circuit of the docks and reports conditions to marine headquarters.

#### Marine Headquarters

At the marine headquarters on the River Rouge, there is a boat dispatcher. He is informed when each dock will need material and what material they will need. The delivering of a boat load of material to a dock is called a job. He assigns a job to a boat and it goes to get the material; all this being recorded and also tabulated upon a board in the room. The board shows, at all times, the location of all boats. As soon as the boat returns with the material, it calls headquarters and the time of the trip, as well as the time to unload, is recorded. In this manner—by knowing the capacity of each boat it is soon learned which boats are best adapted to handling certain materials. For example, the speediest and largest boats would prove best to go long distances after material.

#### Marine Organization

The fleet captain is responsible for the deck crew and the navigation of the ships. The chief engineer is responsible for the "black gang"—engineers and



Drillpress and planer for repairs

firemen—and the machinery. The commissary department sees after supplying the ships with all that they will need while out on their trips. In connection with this department there is a large store room at the headquarters.

One interesting thing at this River Rouge dock is a large and complete marine repair shop. The equipment here includes 4 lathes, varying from 6 to 14 ft. in length, a drill press, a large planer, a punch and shear machine, a movable crane, a forge and anvil, acetylene outfits, and a 100-lb. steam-hammer. A 300-lb. hammer is being installed to replace the 100-lb. hammer. This will enable much larger pieces of work to be done. The ship's carpenter shop has a bevel jig saw, a cross cut saw, a band saw, a planer and a jointer. There is a separate boiler shop where not only the ships' boilers are repaired, but also the boilers from the locomotive cranes at the yards. This shop also makes the repairs on clam buckets, derrick booms, and similar heavy pieces.

A large and complete supply of marine machine parts is kept at hand and when a ship comes in for repairs, all hands fall to and get her under way again as quickly as possible.

Last spring a ship was brought in to be overhauled. A marine repair company wanted \$50,000 for the job, which was sent out to the dock. The hull was completely overhauled from the inside—the company does not own dry docks—and the main engine taken out and cylinders rebored. The small scotch ma-



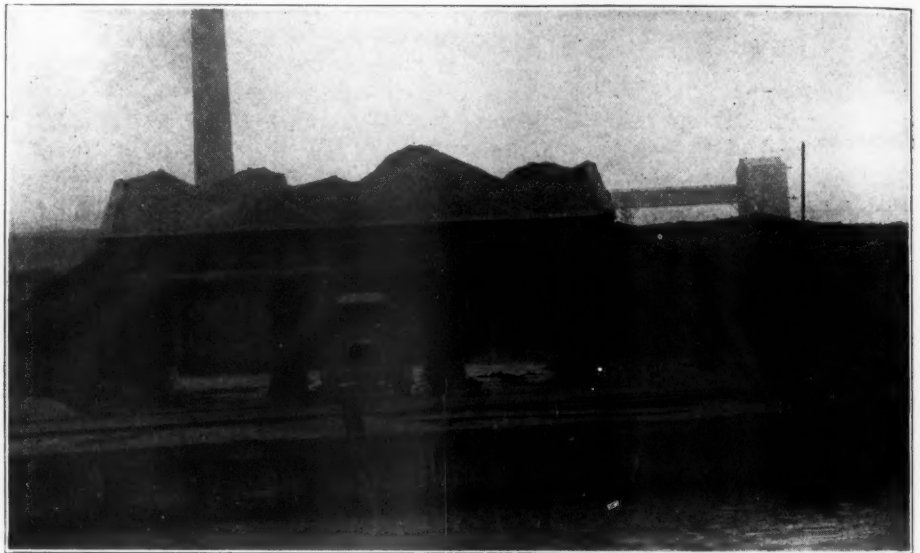


Dock scene at River Rouge showing unloading facilities

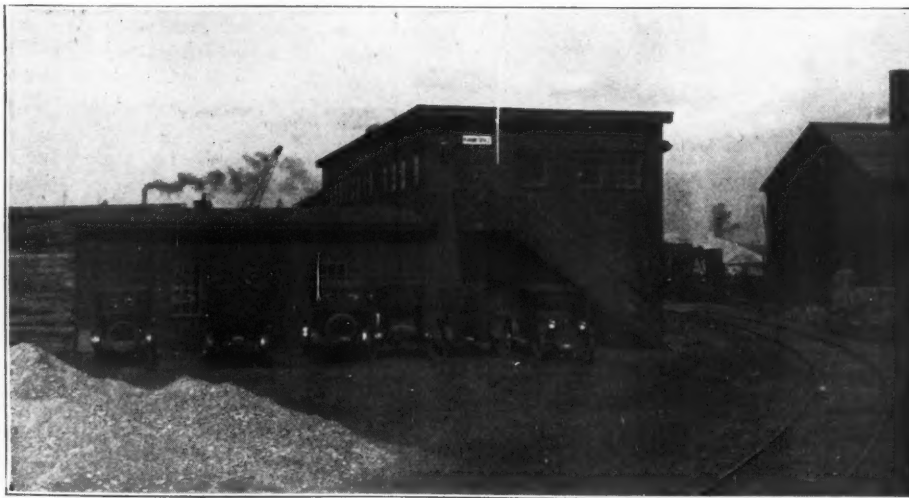
rine boiler was overhauled and relined on its saddles. The engine was reinstalled and the shaft relined. This boat is now on duty, as good as new, at a cost much less than \$50,000.

#### Sand and Gravel Boats

The older boats are of the wooden barge type, but the later ones are the most up-to-date steel boats afloat, as is illustrated by the view. The boats are of two classes as to the method which they have in loading materials. Some use small  $1\frac{1}{2}$  yd. clamshell buckets, while others are equipped with two 10-in. centrifugal sand pumps and suck the material aboard. This later type is sometimes supplemented with a derrick clamshell, so that its field of action is increased. The suckers are generally sent out after sand and the depth to which



Loading bins at downtown dock yards



Marine headquarters at River Rouge dock for boat dispatcher

they can dig is limited to about 30 ft. The suction end of the hose has a wire screen covering to reject the large material. The clamshell bucket boats may dig as deep as 50 to 60 ft.

It generally requires 6 to 8 hours to

load a boat and about 6 hours to unload. The docks are all equipped with large bins, so that the material may be handled into the bins and trucks loaded by gravity. Where the bins do not have a boat load capacity the rest

is put on stock piles and a large 110 ton wide gauge locomotive crane with a 4 cu. yd. dipper is used to either unload the boats or to handle sand and gravel from stock pile to the bins.

#### Marine Department Cost Accounting

In cost accounting for the marine department, it is considered that the marine department sells the material to the docks. The marine department charges the docks a flat rate per hour for handling material. The lengths of trips and the average time of loading and unloading each kind of material is known and when there is a variation, the reason is traced down. Each trip is called a job and each job is numbered. In case a ship is held up by weather, the weather delay is chargeable against that job, but

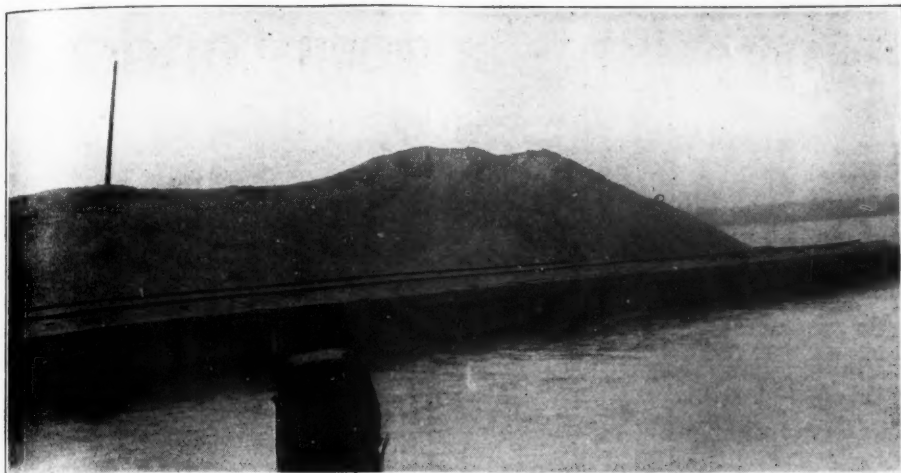
where there is a delay due to repairs or break down the time lost is prorated against all of the jobs of the month. At the end of each month a detail statement is made showing the various fractions in the cost of a yard of gravel.

#### City Delivery System

A considerable portion of the material handled by the company is used in Detroit—thus bringing into play a city delivery system of very large scope. This division of the work comes under the direction of Mr. Lindemann, operating manager. There are 10 inland yards and 5 water front yards or docks. All orders for material come into the main office and are distributed to the nearest yard.

The company owns a fleet of 60 Packard and Pierce Arrow trucks and two hundred teams for this work. At present the unusual volume of orders has necessitated the addition of 17 hired trucks. All vehicles are painted a uniform red and bear the sign of the firm—





Storage at a dock yard

being kept neat and trim so that their continuous presence all over the big city is of additional advertisement value. Practically all of the auto trucks are of five-ton capacity.

The material, as has been explained, is delivered to yards by either boat or cars and is deposited in bins. The trucks are quickly loaded from these and are off on delivery.

#### Truck Dispatcher System

Owing to the large number of vehicles in operation it is found to be of advantage to keep very close tab on the operation of each truck. For this purpose a dispatcher system and headquarters is maintained. Each evening the yards call the dispatcher and tell him the amount of long and short hauls scheduled for the next day. The truck drivers also call in each evening and they are assigned so that the yard having the most business gets the greater portion of the trucks.

At the yards office there is a large map from which the distance to the job is scaled and the average time to make the trip there and return is computed. When the driver is given a load of material it is entered upon a card which he carries, the kind and quantity of material he has, how far it must be hauled and the computed time.

After making the trip the driver records the actual time of the trip and if it is over the allotted time he makes such explanation as, delayed so many minutes at job, or whatever the delay may be. At the end of the day this card is sent to the cost account department, where a complete record of each truck is kept.

#### Truck Performance Records

Each truck is numbered and the amount of work done is figured out and credited to that truck. Each evening the trucks return to the central garage,



Typical U. F. &amp; S. Co. dock scene

where all repairs, adjustments and supplies are received. The truck is charged with all that it receives and so the actual earning may be computed.

Such items as tires are of particular interest for it is readily learned which brand of tires will give the most ton-miles for the cost. Extensive experimenting in tires has been carried on until the company has learned just where the greatest money value in tires may be obtained. The cost accounting department receives all data of this kind, tabulates all of these items and at the end of the month is able to make a statement showing the actual cost per ton-mile of material, and what the constituent items are in this cost. A comparison with previous months will show variations which may be traced down and excessive costs eliminated or reduced.

#### Get-Together Meetings

The main office of The United Fuel & Supply Co. occupies the entire second floor of the Free Press Bldg., at Detroit.

A novel plan of social get-together meetings has been inaugurated. One night of every second week of the month the heads of each department meet and dine together at company expense. Quite singularly the officials of the company are present only upon invitation at such times when an unusually hard nut is to be cracked. The men propose changes, or offer constructive criticisms upon the other departments. Great interest has evolved from some of the meetings when it has been concocted to bring concerted judgment upon some one department and where the case has been called and it is found that the to-be prosecuted has a brief which not only covers himself but indites some other department. "The best part of it all,"

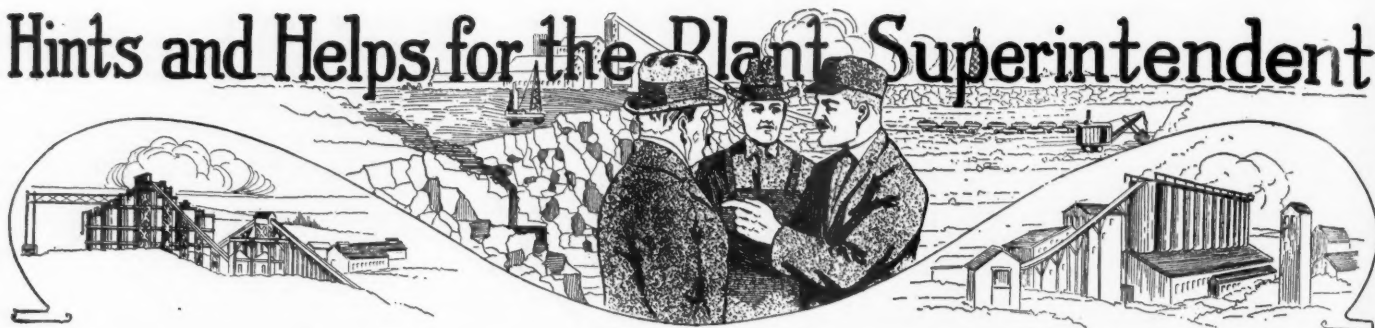
one of the members says, "is that there is no chance for discord at any time, because a man has a chance to air all troubles at these meetings."

The president of the United Fuel & Supply Co., C. N. Ray, is well known to readers of ROCK PRODUCTS as one of the foremost building supply dealers of the country. He is president of the Michigan Sand & Gravel Producers' Association. George F. Barr is vice-president and treasurer.

#### Interstate Commerce Commission Avoids Real Issue

THE INTERSTATE COMMERCE COMMISSION in final report on the Illinois-Indiana rate controversy, recommends that no changes be made in rates on sand, gravel or crushed stone; but suggests a review of these rates should be made in order to remove discriminations which may exist, and that each commodity should be carefully studied and dealt with in the light of its own peculiar facts and circumstances.

# Hints and Helps for the Plant Superintendent



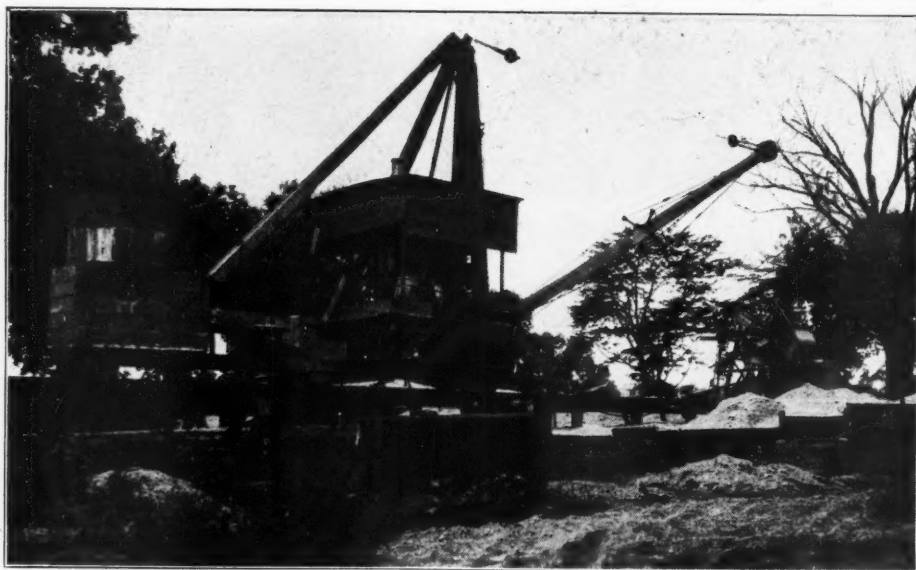
## Special Traveling Crane for Gravel Loading

THE COON RIVER SAND CO., Des Moines, Iowa, R. Snoddy, general manager, pumps sand and gravel from a river to a washing and screening plant on shore. The washing and screening plant is very simple. One unit consists merely of an inclined screen against which the stream of sand and gravel is thrown. The other unit, used for a more carefully graded material, consists of a rotary screen with bucket elevator discharge, the whole being driven by an oil engine, which is the only part of the machinery that is housed.

The screen separates the pumped material into sand and gravel, the gravel rejections of the screen going into one bin by gravity, while the sand is elevated



Derrick traveler showing wagon-loading bins at the right



Derrick traveler for handling sand and gravel in low bins

to a chute where water is supplied to carry it to the second bin, or storage pile. When the dredge is pumping in sand, the dredge discharge may be directed into the sand bin without going through the screen.

These bins are very low, their sides being not over 4 or 5 ft. above ground level, as the accompanying views show. To handle the material out of them Mr. Snoddy has constructed the ingenious device shown in the two views. This is

a traveling derrick, or crane, mounted on a triangular-frame truck, which runs on a trestle through the center of the bin, or storage pile.

The truck has a gauge of 15 or 20 ft., but practically all the weight is carried on the four wheels on the right-hand side of the truck, as shown in the views. In other words, the truck is built like a railway section man's 3-wheel velocipede, with which every one is familiar. It has a boiler and hoisting engine mounted

over the front wheels and a concrete counter weight and water tank over the rear wheels.

This traveler moves up and down the length of the bin, transferring its bucket load to a row of elevated wagon bins.

The layout described permits a very economical plant, both in first cost and in operation. It is said that the cost of rehandling the material with this type of traveler is between 3 and 5 cents per cubic yard.

## Cableway Charges Lime Kilns

BECAUSE of a 150-ft. deep intervening gully between the quarry and the lime kilns, the Glencoe Lime and Cement Co. uses a cableway at its Mincke plant.

A special car has been built at the quarry. It consists of a box-bed and truck. The box is so built that it can be picked up in the quarry and swung across to the kiln loading track. The bed has but three sides—one end being omitted for dumping purposes. At the balance point an axle is mounted so that when the weight of the loaded bed rests on the axle it may be easily dumped.

The truck at the kilns is only half as long as the bed and at the forward end there is a pair of forks mounted on a turntable so that when the bed axle rests in these forks the car may be swung around and dumped. Five kilns are charged by three men.



### Self-Dumping Quarry Car

THE TWO VIEWS to the right show a type of side-dumping quarry car, used at the St. Genevieve, Mo., plant of the Peerless White Lime Co., St. Louis. These cars were designed by James Marr, superintendent of the plant, and are built at the company's own shop.

The car bodies are made of planks, reinforced with steel plates and rods. An inverted V in the middle of each car divides it into two self-dumping compartments. The sides of the car are carried on hinges attached to a steel frame, which fits over the top of the car body. The sides of the car are drawn in at an angle of about 30 deg., so that the side doors will swing free when released.

When ready for loading, the side doors are held in place by two latches or bolts attached to a lever arm in the middle of the door. When closed the lever arm stands in a vertical position, projecting several inches above the top of the car.

When the car is drawn up the incline and reaches its dumping position opposite the crusher the upraised ends of the levers on the sides of the car come in contact with projecting tripping bars, which throw the levers back and release the latches.

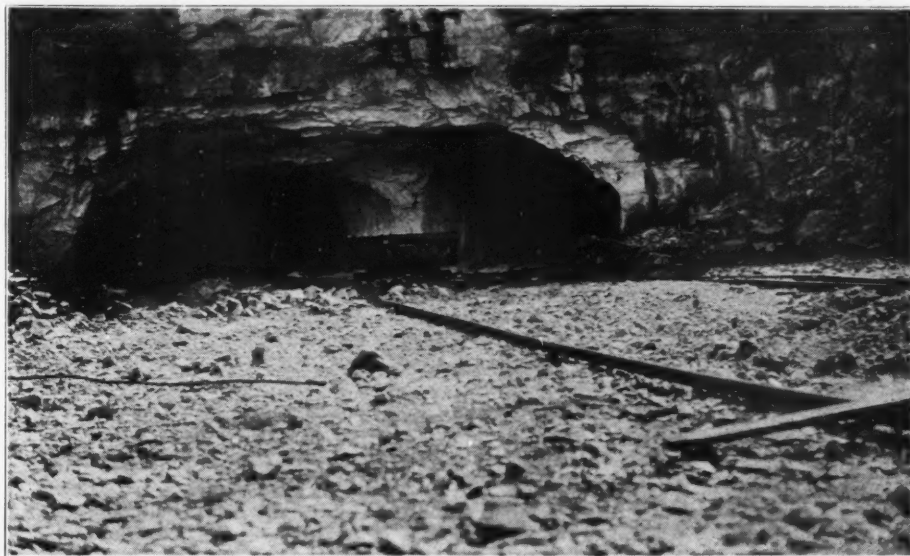
Incidentally, the second view shows an interesting quarry expedient to obtain a certain kind of limestone in its pure and undiluted state.

### Question Box

**G**OT a problem you want help on? Send it in. We will agree to find some operating man who can answer it.



Quarry car with automatic side-dumping doors, designed by James Marr, superintendent of the Peerless White Lime Co.



End view of automatic side-dumping quarry car



Clinker coolers at the plant of the Hawkeye Portland Cement Co.

### Cement Clinker Cooling

THE VIEW to the left illustrates the system of clinker cooling in use at the Hawkeye Portland Cement Co., Des Moines, Iowa. These coolers are set end to end with the kilns and discharge the clinker into pits outdoors, from which it is taken by bucket elevators to concrete storage bins. The coolers are equipped with perforated end sections and ring plates at the ends to prevent their discharging larger pieces of clinker than the elevator can handle. The plant was recently rearranged so as to utilize for the storage of clinker the cylindrical reinforced-concrete bins formerly used for finished cement. The clinker is drawn from the bottom of these bins by table feeders to a belt conveyor in a concrete tunnel, and thence transferred to the grinding room.



# Union Lime Company Finds Advantage in Scattered Units Over Central Plant

Six Wisconsin Plants on Three Different Railways All Work Same Stone—Still Use Wood for Burning—Developing Crushed Stone Side of the Business

**C**LOSELY IDENTIFIED with the development of the building industry in Wisconsin is the history of the Union Lime Co. of Milwaukee, operating a group of plants on the ledge of dolomitic limestone that traverses Wisconsin.

For almost a century, the quarries, now operated by this company have supplied eastern Wisconsin with quicklime and building stone. At each of the plants there is some ancient landmark in the way of a kiln abandoned many years ago. The lime output continues largely brick lime, while the output of stone has changed from rubble to crushed. The present management has watched the business grow from a group of isolated plants, supplying only a local demand, to a large enterprise, firmly established in a selling territory that extends as far west as Montana and Colorado.

The six plants are all located in the vicinity of Lake Winnebago and together constitute one of the largest operations of this character in the country, certainly the largest operation in magnesian white lime in the United States.

## Advantage of Scattered Units

There is an advantage in these scattered plants in that they are located on different lines of railroad, three being on the Chicago & North Western, one on the Soo Line, one on the Chicago Milwaukee & St. Paul and the sixth having facilities on both of the last named lines. Especially in bulk lime where prompt delivery is so essential, this is no small consideration, even aside from higher rates or switching charges.

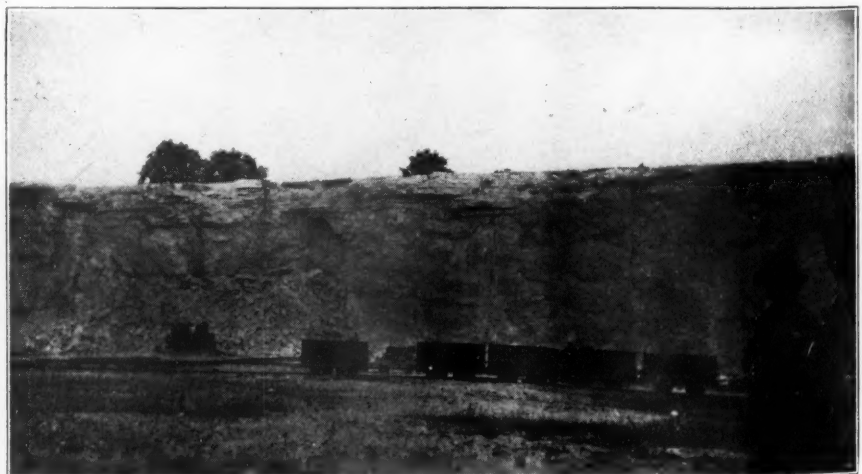
The quarries are all in the dolomite of the Niagara formation. The outstanding characteristic of the stone is its durability; it has been in riprap, flags and curbs for fifty years and in buildings for much longer periods without showing any signs of disintegrating from the action of water and frost. The depth of the ledge has not been exhausted at any of the workings but from deep wells driven in the vicinity, the ledge at Brillion, for instance is known to be over 700 ft. thick. The stone calcines to a pure white lime, and in the process wood is still used at all of the kilns. The cut-over pine lands of northern Wisconsin still afford kiln wood and wood seems to produce a more diffused heat, result-



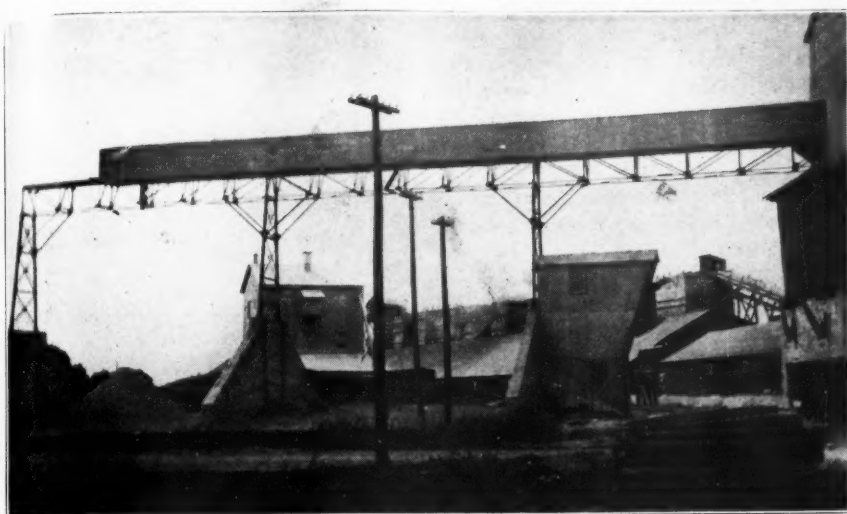
Bird's-eye view of Marblehead, Wis., works



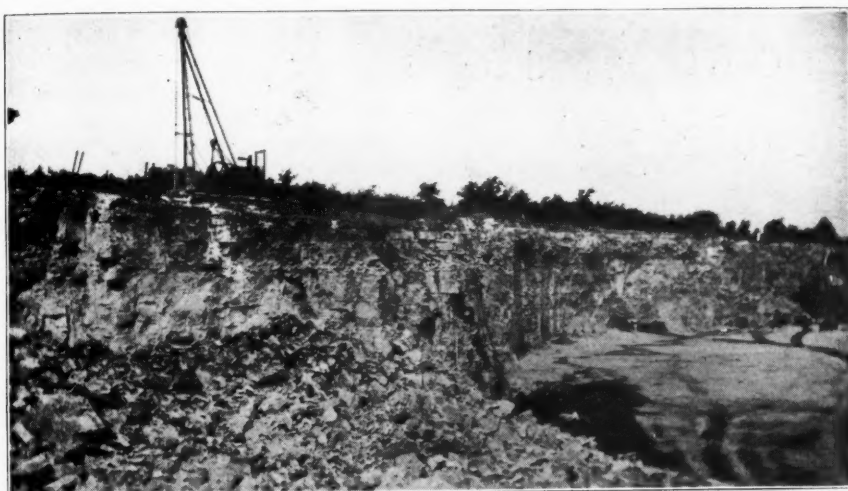
Kilns and crushing plant at Hamilton, Wis.



Quarry at Grimms, Wis.—No strata in the dolomite



Lime plant stone storage at Brillion, Wis.



Quarry at Hayton, Wis.



Results of a good shot at Hamilton

ing in a better product than any other fuel that has been tried on Wisconsin stone.

The company operates hydrating plants at High Cliff and Brillion. The demand for this product in the territory covered is far below that in other districts, due no doubt to the fact that the great bulk of Wisconsin lime has heretofore been marketed in bulk, whereas most of the product of Ohio, Indiana and Missouri was sold in wooden barrels; so that producers in those states were able to offer hydrate at prices practically equal to price on barreled lime. On the other hand the Wisconsin manufacturer is obliged to quote hydrate to a trade accustomed to using bulk lime, at a much higher relative price.

#### Crushed Stone Business Growing

There are crushing plants at four of the locations, Brillion, Marblehead, High Cliff and Hamilton, each having a No. 5 and a No. 3 gyratory. This feature of the business, originally undertaken to dispose of quarry waste economically, is constantly becoming more and more important. Two quarries, those at Grimms and Hayton have no crushers.

At Brillion there are ten kilns, a hydrating plant, crushing plant and stockpile for stone. The quarry, which has been constantly worked for 50 years exposes a face 80 ft. high.

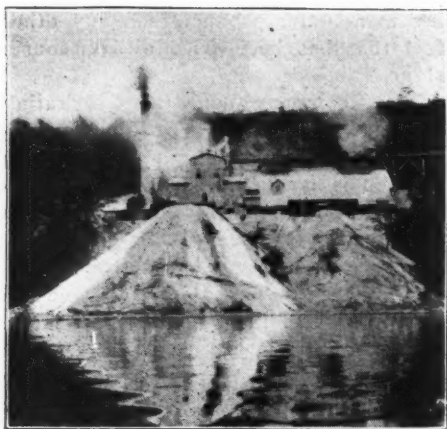
The plant for stocking stone at Brillion is a very efficient one, a double belt conveyor forty feet above the ground to carry two sizes and a tunnel underneath with bin gates and a conveyor to carry the material to cars. Its capacity is 6,000 cu. yds. Electric power is used throughout at this plant.

The High Cliff plant is located on the picturesque east shore of Lake Winnebago. An interesting feature in operating is the contrivance by which loaded cars leaving the quarry at the top of the ledge are used to pull the empty cars from the plant below. The loads are eased down a steep incline, to kilns, crushers or rubble track. There are three kilns at this point, a hydrating and a crushing plant.

Grimms, nine miles east of Brillion, is exclusively a lime plant, consisting of 8 kilns. The ledge, which is here without bedding, is some 150 ft. above the level of the land. The quarry, exposing a face 60 ft. high, is well above the kilns and a "dinky" is used to haul the stone from the quarry floor to the tops of the kilns. At Hayton on the C. M. & St. P. there are four kilns, and here also the top of the kilns are nearly on a level with the quarry floor.

Seven miles south of Fond du Lac, on the C. & N. W. is the Marblehead plant with 5 kilns and a No. 5 and 3 crushing





High Cliff plant, Lake Winnebago

plant. The face here is 100 ft. high with little or no overburden. The stone is hoisted to kilns and crushers. Hamilton on the Soo Line, also near Fond du Lac, has 5 kilns and a crushing plant, and the

stone formation is very similar to that at Marblehead.

The group of plants are without doubt some of the neatest and best kept in the Northwest. They go far to disprove the general impression that crushing plants and lime kilns are necessarily dirty. Machinery, tools and all equipment are kept in excellent condition, and every tool and implement seems to have its place. The company at each plant has provided a number of houses and cottages and these, too, are kept well in paint and as well repaired as the tenants could wish. Fred Mumm, who was raised in the lime business at Brillion, is general superintendent.

The general offices of the company are at Milwaukee, Wis. The president is O. W. Robertson; the vice-president and general manager, Charles Weiler; the treasurer, M. J. Ash, and the secretary is R. C. Brown. R. W. Scherer, former



Fred Munn, general superintendent, and R. W. Scherer, sales manager of crushed stone

secretary of the Wisconsin Crushed Stone Association, is manager of sales of the crushed stone department.

## Determination of Standard Sizes for Large Aggregates

Mississippi Valley Highway Association of State Highway Officials and National Association of Sand and Gravel Producers Appoint Committees to Work Out Sizes and Test Methods

**B**ECAUSE OF THE VARIETY of specifications for aggregates and the number of different types of screens being used to produce commercial crushed stone and gravel, it has become desirable to select a standard specification for determining the sizes of aggregates. This, it is claimed, will be of equal value to both the producer and the purchaser, for there will be a definite understanding at all times. The wide adoption of such a standard will make it possible for a purchaser to buy from several producers and by using the same specifications get at least the same size of aggregate.

With such an object in view, the Mississippi Valley Association of Highway Officials appointed a committee on aggregates to investigate a specification for the determination of sizes and to devise a laboratory method for testing the size of aggregates. Prof. T. R. Agg, head of the Highway Engineering Department of Iowa State University, is chairman of this committee, and the data given in this article is the result of a recent interview with him at Ames, Iowa.

The National Association of Sand and Gravel Producers has also appointed a committee to work with the Mississippi Valley Association's committee. E. Guy Sutton, business manager of the National Association of Sand and Gravel Pro-

ducers, is chairman of this committee. It is proposed that the two committees meet in Chicago some time during the month of December. One committee will represent the highway departments and the other the producers. At this time the two interests will get together so that the standard will be representative of what will be most satisfactory to both groups.

Since the Mississippi Valley Association has made it necessary for its committee to report this year, a tentative program has been formulated by them to be presented at this meeting. A specification of sizes will be presented and sizes will be defined.

At present there is considerable confusion as to the meaning of, say, a 2-in. stone. Is it a stone which will pass a 2-in. circular perforation, a 2-in. square perforation, or is it a stone whose largest dimension is 2 in.? This will be determined, and also a standard laboratory method for testing sizes of aggregates will be accepted. A relation between the square and the circular perforation will be worked out so that either may be used to produce the specified standard sizes. At present some experimenting is being carried out in the laboratories of Iowa State University to this end.

Since there will be a definite relation between square and round perforations, it will make little or no difference what screen perforation is used in defining standard sizes. The main point is that standard specifications of sizes should be adopted and defined.

Although the American Society for Testing Materials has adopted standards for small sizes, nothing has been done with larger sizes of aggregates. At this time it is proposed that standards shall be adopted which will include both the large and small sizes.

## Fresh Atrocities by the Railroad Administration

**C**OMMENTING on the actions of the Railroad Administration restricting open-top cars to coal loading, which was made effective on October 16th, we expressed the opinion that it was the beginning of the end so far as this season's production was concerned. With the revocation of that order, it was announced that there should be no limitations placed upon the loading of sand and gravel. Although this has been stated repeatedly by the Administration, few shippers have been able to obtain anything like a reasonable supply of cars, and the service has been so irregular that a great many plants would have been dollars ahead had they closed permanently in October. Now we have a new order, promulgated Nov. 26, instructing that all open-top cars be sent to the mines. In applying the order, shippers have been advised that no cars will henceforth be furnished for sand, gravel or stone loading.—Ben Stone, in Weekly Bulletin of Illinois Sand and Gravel Producers' Association.



# Remodeling of Old Rock-Crushing Plants

## Part I—Opportunity of the Small Producer and His Problems

By Brownell McGrew

THERE IS PROBABLY NO INDUSTRY in which the continued existence of the small producer is better assured than in the quarry industry. Conditions well known and peculiar to the field of quarrying make this an established fact. The small operator is, in most cases, protected from his large competitor by the very freight rates that restrict his own market. Then, too, there are large sections of the country that will not, at the present day, support a large centralized operation, due to the scattered market and the very potent influence of freight rates on the distribution of a bulky commodity, such as crushed stone.

On the other hand, the big producer, with his large output and low operating cost, has undoubtedly had a very real effect on crushed stone prices, inasmuch as the quarryman, large or small, must sell his product at somewhere near the standard territorial price. This is an economic truism that is exemplified in any line of commodity manufacture. Coupled with the fact that crushed stone prices have not kept pace with the soaring cost of practically everything used in its production, it furnishes the principal reason why a goodly number of small quarrymen are operating today on an uncomfortably scant margin of profit.

### Looking Ahead

The foregoing speaks for present day conditions. Looking ahead into the near future, it does not require telescopic foresight to visualize the advent of the eight-hour day in the quarry. It must be obvious to all that it is coming—and that the sooner it does come, the sooner will the quarry be on a firmer basis to compete with other industries for the more desirable class of labor. Its introduction, however, will at once increase the unit cost of labor, overhead, insurance, interest, etc., and decrease the output.

This latter contingency leads up naturally to the question of demand and supply. The writer does not care to undertake the responsibility of making a definite comprehensive statement on this subject; but what he has seen of conditions in the eastern part of the country leads him to firmly believe that a substantial development of our quarrying facilities is necessary in order to meet the coming demand for commercial sizes of crushed stone. Particularly is this true in those states that are now undertaking programs of extensive road building.

Certainly, the logical first measure toward bringing the supply to a figure that will correspond with the demand, is a healthy development of present workings, rather than a wholesale new construction program among quarrymen. It is true that a shortage of crushed stone might operate to carry prices upward, and thus bring about a temporary harvest period in the industry; but it is equally true that such a condition would result in an unnatural and greatly augmented period of new construction and development, which, in the end, could have only one outcome—and that an un-

### Editor's Note

THIS IS THE FIRST of a series of three articles on remodeling old crushing plants to meet the production demands which seem assured for the next few years at least. The author needs no introduction to ROCK PRODUCTS readers, as he has already established a reputation as a crushing-plant expert through his previous articles on "The Design of Large Rock Crushing Plants."

favorable one for both new and old operators.

The foregoing should not be construed as being an opinion that new development is unnecessary. On the contrary, there are several territories in which new quarries are badly needed. But, it will be better for all concerned if new development goes forward at a natural and healthy pace. And one means of governing the pace lies in the hands of the small operator. That means is to place himself in a position to supply his market, in so far as he can do so without undue risk to his investment.

### Problem of the Small Producer

Most quarrymen would be loath to admit that they are not holding the items of production tonnage and unit cost to the best possible figure obtainable with their present equipment. Granting that such is the case, there may be an opportunity for improvement by altering or adding to the present equipment; and this does not always involve the expenditure of a large sum of money for its accomplishment. It is the purpose of

this article to deal with this question as applied to the small crushing plant, and to show how changes in the plant may affect not only the crushing cost, but also the cost of quarrying the stone and getting it to the plant.

It would be impossible to detail all that may be done in the way of "doctoring" old crushing plants to render them more efficient and more productive. Local conditions must govern the process of remodeling just as they must in new design; and in the majority of cases the former problem has more restricting and complicating phases than the latter. The writer will, therefore, endeavor simply to outline in a general way some of the more important aspects of plant remodeling, and to analyze their effect on output and cost.

The next instalment will deal with changes designed to bring steam-shovel operated quarries up to their former output under land-quarrying methods.

### Jaw Crushers for New England Trap Rock

SIR—In the November 22 issue of ROCK PRODUCTS, on pages 34-35, there is a description of the complete plant of the Connecticut Quarries Co. at Middlefield, Conn., and the sixth paragraph describes the initial crusher as a No. 36 gyratory.

As a matter of fact, the initial crusher at this quarry is a 36-in.x54-in. Type "C" Buchanan all-steel jaw crusher, which has been in continuous service in this quarry since the early fall of 1916.

The Mt. Carmel plant of the Connecticut Quarries Co., mentioned in the latter part of the article, is now being equipped with an initial large Buchanan all-steel jaw crusher, and almost all of the important large quarries in New England use these same jaw crushers as initial breakers. We are also building for the Plainville, Conn., quarry of the Connecticut Quarries Co. a 42-in.x54-in. Type "C" jaw crusher as an initial breaker.

Referring to the latter part of the description, where the names of the officers are mentioned, among them Arthur S. Lane, would state that Mr. Lane is also treasurer of Messrs. John S. Lane & Son, Inc., Meriden, Conn., and that this company has one of our big jaw crushers, 42-in.x54-in. Type "C," located at their Westfield plant, and they are also installing a large set of our crushing rolls.

C. G. BUCHANAN CO., INC.  
By Gordon Buchanan, Sec'y and Treas.  
New York City, Nov. 26, 1919.

# Quarry Has Unusual Stone Deposit

Large Ohio Stone Quarry Operator has Recently Added Two More Plants to Organization—Produces Stone for Sugar and Cement Industries

**THE BLUFFTON-LEWISBURG STONE CO.**, Lima, Ohio, which owns and operates six plants in Ohio and Indiana, has very recently taken over and reconstructed two plants at Lewisburg, Ohio. The fact of the matter is, that one of them is still under construction although it is in operation. Owing to the unusual amount of business, the setting up of machinery was rushed and as soon as it was completed operation was started without waiting to house the

crusher.

The capacity of the Bluffton plant has been recently increased by the addition of a motor driven 48-in. Symons Disc crusher. This machine enables the increased output of small sizes. Should it become necessary the plant's entire output, 1,000 tons per day, could be reduced to ½-in. material.

At this plant a close record has been kept on the cost of dynamiting. A steam operated well drill is used and 5-in. holes are drilled at the rate of 60 ft. per ten hours, either one in back of the other on zigzag; the first row 12 ft. and the second 24 ft. from the face. A charge of 90 lbs. of powder is used per hole, which is filled with fine stone chips. The discharge is effected by two detonators per hole and a 220-volt electric current. The output of this plant is mostly for roads, concrete work, and railroad ballast.

## New Plants Just Rebuilt

The two new plants at Lewisburg differ from most stone plants because of the character of the deposit of stone which is quite unusual in that it is 98.47 per cent calcium carbonate. Because of this it is valuable in the manufacturing of sugar and cement.

At the north pit (a mile and a half north of Lewisburg) there is a 23 ft. layer of stone on top of the pure limestone, but at the south plant, the pure material comes to the surface.

Where necessary the low calcium carbonate stone is removed and used for road and concrete purposes, and the high calcium carbonate material is sold to manufacturers. The company now has an order for 25,000 cars of this limestone from a large cement plant in Michigan.

## Plant Under Construction

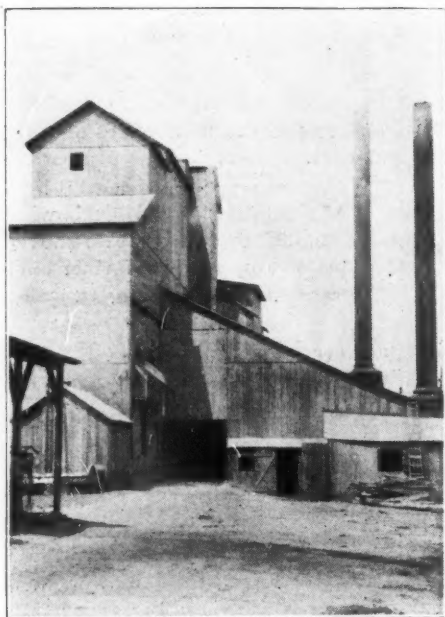
As has been stated, the largest plant owned by the company is just being completed. As yet the quarry at this plant has not been fully equipped, and this winter a set of new larger quarry cars will be installed and the temporary incline now in use will be replaced by a permanent structure.

It was believed that owing to the short season which a plant can operate that it would be advisable to postpone as much of the construction as possible till next winter. By so doing the year's output of the plant can be increased and the plant can be completed this winter when the men will be idle.

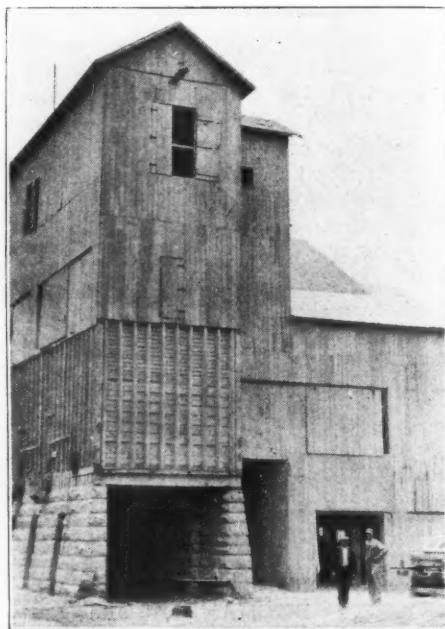
## Quarry Operation

Rock is excavated from the quarry face by a 70-ton locomotive steam shovel with a 3½ cu. yd. dipper. All-steel end dump cars of three yards capacity are used to transport the material to a 28-in. gyratory crusher. Since in dynamiting, the rock seems to be broken up well, there is but little trouble with oversize.

A 42-in. elevator 50 ft. center to center of pulleys, elevates the stone to a 60-



South plant at Lewisburg



North plant at Lewisburg, and managers



Bluffton plant of the Bluffton-Lewisburg Stone Co.



in. scalper screen. Material over 8 in. is rechuted to the secondary crushers—No. 8 and No. 6 gyratory crushers. The sugar stone is the 8 in. to 4 in. stone and is chuted to a storage bin of two cars capacity. In event that there is no need for this material it may also be returned and recrushed to smaller commercial sizes.

The sizing screen is 60 in. in diameter and 21 ft. in length, and here all commercial sizes are made and sent to proper storage. Because of the production of the large stone, the crushing at the plant is comparatively small.

#### Supplies Own Power

Power is furnished from two 200 h.p. return flue boilers, and a 300 h.p. side crank engine. All transmission is either by rope or chain drive, and the entire plant is run as a unit.

The officers of the company are: Joseph Patterson, president; E. T. Paul, vice president, and Allen Patterson, secretary and treasurer. F. R. Patterson is general manager of the Lewisburg plants and Robert Mollett is superintendent of the new plant being completed. All business is transacted through the central office at Lima, Ohio.

#### California Highway Commission Rushing Road Building

OAKLAND, Calif.—The California Highway Commission has ordered a careful survey, estimate and report on the proposed Oroville-Willows highway. In order to rush the temporary surfacing of the worst sections of the Weaverville-Redding lateral, the California Highway Commission has ordered a stone-crushing outfit, with elevator, bins and engine, so that gravel may be crushed and stock-piled and spread on this road where needed.

Road work in Yolo County, under the \$1,000,000 bond issue, is under way. A field force is engaged in the establishment of grades for the 74.45 miles of highway to be built.

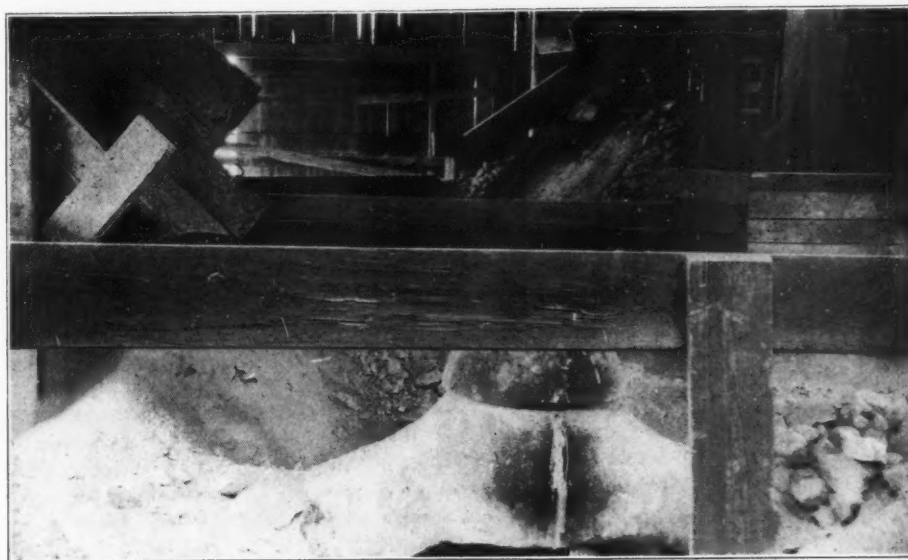
The California Highway Commission has ordered the placing of 7,500 cubic yards of gravel on the Lakeport lateral between Hopland and the foot of the mountain.

Four obstacles stand in the way of California's good roads program for 1920.

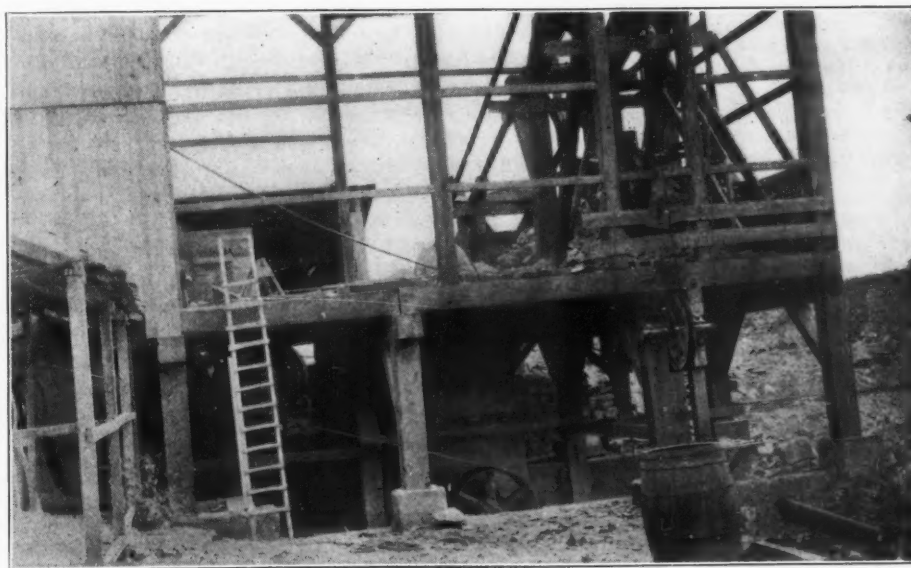
If the money markets are favorable for the sale of state highway bonds; if the Railroad Administration will assign enough freight cars to supply the contracts with the necessary material; if the supply of labor does not run short, and if the wage of labor becomes fixed, or more nearly so, than at present—then State Highway Engineer Austin B. Fletcher predicts a busy year in 1920.



Stone deposit which runs high in calcium carbonate



Crusher arrangement of the new plant



Constructional view of the Lewisburg plant now being built



# Profit-Sharing at the Plants of the Marble Cliff Quarries Co.

A Plan of Industrial Democracy Which Has Been in Effect Since Last April

SOME TIME LAST SPRING the editor of ROCK PRODUCTS received the following communication from an employee of the Marble Cliff Quarries Co. It remained pigeonholed and unpublished for many months because the editor could not see its relevancy and appropriateness for ROCK PRODUCTS' readers. Recently his eyes were opened by a visit to the Marble Cliff company's plants at Columbus, Ohio; so the "Ravings of the Tipple Superintendent" are published herewith (verbatim), and apologies offered for the delay:

## The Relationship of Marble Cliff Quarries to Man

WE'LL let the drillers and the shooters of this body be the hands,  
Let the shovels and their crews be the arms of this great man;  
Let the cars be the feet that we have to stand upon,  
And the men with locomotives be the legs that move the stone.  
Now the crusher of this quarry plays a most important part,  
So with the men to run it we will let it be the heart.  
There are many vital organs yet contained within this trunk,  
And many important workmen without whom we'd go kerplunk.  
There's the head to be considered and we'll let it be the comp'ny,  
That pays us off, then takes the stone, and turns it into money,  
And when it gets that payroll back and still has some to spend,  
It says, "Here, boys, you've done your bit, come get your dividend."  
Now I have a man who looks at you just like he was your father;  
He's your superintendent, boys, and now he's going to be your doctor.  
Now if there's any part of you which causes you much pain,  
Take it up with this great doctor and 'twill ne'er occur again.  
Now we'll each one try to do his part to keep this body strong,  
And when the doctor looks us over he will know there's nothing wrong.  
Now this verse was constructed without regard for grammar,  
And if I live through this one, no more, so help me, 'Hanner.'  
MORAL: If you don't do your bit you'll have to take your medicine, and it sometimes comes in cans.

It is evident that the foregoing comes from the heart rather than from the head of a loyal booster for the company, and the reason is this:

### Company Adopts Profit-Sharing

Although crushed-stone quarry labor-



W. H. HOAGLAND

Vice-President and General Manager, Marble Cliff Quarries Co.

ers are generally unorganized and no immediate labor troubles were threatened, the management of this company clearly saw the industrial issue of the times and set about to meet it, as it probably must be met by all operators sooner or later. The result was the introduction of a genuine profit-sharing scheme, not a bonus or piece-work system, which is not uncommon in the quarry industries, but the real thing.

The fundamental principles of this profit-sharing are as follows: (1) The company promises to pay the prevailing rates of wages for the Columbus district; (2) a daily cost account is kept which covers the items of labor, overhead, maintenance, repairs, depreciation and sinking fund, and includes a 6 per cent charge for capital invested; (3) a daily tonnage report is made, including both production and sales and the prices received for sales; (4) all sales receipts over and above those required to take care of the costs shown are divided 50-50 between the employees and the owners of the plant in the form of quarterly dividends; (5) all employees, from general manager down, share in these profits pro rata, according to salary or wages; (6) an employee must have been in the service of the company at least three months in order to participate; (7) the daily cost

sheets are accessible to all employees, and any of the books of the company are open to inspection by a committee of the employees at any time they see fit to examine them.

### Quarry Business Peculiarly Suited to This Scheme

The owners of the Marble Cliff Quarries Co. also have brick plants where profit-sharing has been installed, but the problem is more difficult there. In fact, it is stated, that few industries lend themselves so readily to such a scheme as the quarry industries, because it is comparatively easy to post daily production, costs, shipments and receipts side by side within 24 hours of the actual accomplishments. This means that even the densest laborer may comprehend the relation between yesterday's production and today's profits, or yesterday's lack of production and today's losses.

This is considered a real fundamental in the successful working out of the scheme with the ordinary type of quarry laborer. No scheme would be fully successful where the employee had to wait weeks or months to see the effect of his industry or lack of industry.

Dividends are paid quarterly as a matter of convenience, but any intelligent employee can figure from day to day his share in the profits that are accumulating. Generally, if exceptionally large profits are earned in any one quarter, by and with the consent of the employees, these profits are not disbursed all at once, but a part is held in reserve for dividends in the leaner quarters.

In cases where dividends accrue to an employee who has left the company in the interim, it rests with the other employees whether or not he is entitled to receive the money; in case of actual need, it is generally given the man; if not, it is returned to the surplus.

### Co-operation for Efficiency

During the war, when all labor was so difficult to get, and when the efficiency of ordinary labor fell off in so marked a degree, there was real concern for the future of the quarry industry. These conditions still prevail in the majority of quarries, but not any longer at the Marble Cliff plants, where the output per man has increased 50 per cent since the initiation of the profit-sharing idea.

And in all the season the company has not dealt directly with its common labor.

There are weekly meetings of superintendents and foremen, at which the management is represented, for the discussion of operating and labor problems and the ways and means of increasing production and cutting costs. It is left for the superintendents and foremen, who are closest to the men and understand them best, to accomplish the results. One of the greatest difficulties in carrying out the plan is to make the ordinary quarry laborer comprehend what it is all about, and no one is better qualified to do this than his foreman, if his foreman is as vitally interested in results as he must be under this scheme.

#### Some Results

It has already been mentioned that the per capita production has been increased about 50 per cent—which has enabled the company to actually reduce war prices and still make a very fair profit, in spite of the constant wage increases, which all industries have had to face. Only in this case, instead of passing the rising wages on to the consumer, the problem has been solved by the only logical solution—increased production.

About 500 employees have shared in dividends amounting to \$25,000, or an average of \$50 each, since last April; and there is probably more to come. This is in no sense a bonus, which employees too often consider a gift, which they are justly entitled to receive as wages in any event. The owners put in their money, the employees put in their labor, brains and energy. Both share alike in the winnings, except that the employees get a greater proportion for the value of their labor than the owners get for the value of their money, since the annual payroll does not equal the capital invested.

This first season under profit-sharing operation has witnessed a pretty severe test of the confidence and loyalty of the laborers, as any student of the times can understand. But this test has only strengthened the faith of the management in the soundness and wisdom of the plan. In other words, the aim of all farsighted employers has been accomplished, the confidence, friendship and loyalty of the employees have been won.

That this confidence is mutual could be shown by many illustrations. For instance, if the management makes an exceptionally large or exceptionally advantageous contract it does not hesitate to let its employees in on the secret—feeling sure that the interests are mutual and will be respected. That the employees are loyal and feel their partnership in the business is evidenced in a thousand little ways; for instance, in the much reduced loss and breakage in tools and equipment. If a locomotive driver has a minor breakdown, he doesn't bring his

engine in and consider himself lucky to have an excuse for a half-day's loaf; he repairs the machine himself, as in more than half the cases he is fully capable of.

#### For the Future

It is not planned to stop where matters are now. There is real mutual interest and friendship to take into account. The management and employees are now considering group insurance of all employees as a satisfactory investment of a part of the surplus. Also a building and loan association of employees is being con-

sidered, so that means may be had for providing the employees with decent homes of their own.

These are activities of the employees themselves. They are, of course, encouraged by the management, but in no sense does the management assume a paternalistic attitude, which would be contrary to the whole scheme. The management has been instrumental in securing a community house, run by the National Catholic Community Service Council, but the management in no way enters into the operation of this service.

### Income Tax Status of New Corporations in the Rock Products Field

WASHINGTON, D. C.—Figures to be used by corporations formed since the beginning of the war in computing their exemptions for income tax purposes have just been announced by the Treasury Department, following an exhaustive investigation.

Section 311 of the Revenue Act provides that a corporation which was not in existence during the whole of at least one calendar year during the pre-war period, and which, therefore, received no income during that period, shall be allowed a specific exemption of \$3,000, and "an amount equal to the same percentage of the invested capital of the taxpayer for the taxable year as the average percentage of net income to invested capital for the pre-war period of corporations engaged in trade or business of the same general class as that conducted by the taxpayer; but such amount shall in no case be less than ten per cent of the invested capital for the taxable year. Such average percentage shall be determined by the commissioner on the basis of data contained in returns made under Title II of the Revenue Act of 1917, and the average known as the median shall be used."

"In pursuance of this requirement of the law," declared the Commissioner of Internal Revenue, "a table of medians has been compiled and will be used in complying with Section 250(b), which provides that 'as soon as practicable after the return is filed, the commissioner shall examine it. If it then appears that the correct amount of the tax is greater or less than that shown in the return, the installments shall be recomputed. If the amount already paid exceeds that which should have been paid on the basis of the installments as recomputed, the excess so paid shall be credited against the subsequent installments; and if the amount already paid exceeds the correct amount of the tax, the excess shall be credited or refunded to the taxpayer in accordance with the

provisions of Section 252.'"

According to the table, producers of gravel and sand, limestone, phosphate, talc and soapstone are to be allowed not over ten per cent, and producers of gypsum will be allowed 11.81 per cent. Manufacturers of fertilizers are also to be allowed not over 10 per cent.

Corporations engaged in the manufacture and sale of brick of all kinds, tilting, cement, concrete construction, including artificial stone, lime and plaster, and all other classes of the stone, clay and glass industry, with the exception of abrasive products, including emery wheels, sandpaper and corundum, are to be allowed not over ten per cent. The excepted manufacturers will be allowed 12.72 per cent.

### Would Standardize State Laws Regulating the Sale of Agricultural Lime

TWELVE STATES have laws regulating the sale of liming materials for agricultural purposes. No two of these are alike in their provisions and there is a wide divergence in the use of terms applied to liming materials. The National Lime Association is making a study of these laws and of the essential provisions that might well enter into a uniform state law on this subject. It is recognized that good regulatory laws of this sort protect not only the consumer, but also the producer of lime materials, and especially those who make a high-grade product.

The National Lime Association believes that all liming materials should be reported on the basis of their content of oxides of calcium and magnesium. It also believes that for all carbonate materials there should be a report on the texture of the materials, based upon a uniform set of screens, in accord with the standard screens recently promulgated by the United States Bureau of Standards. The exact numbers of the screens in the series that should be used for this purpose have not been decided upon and are the subject of conference with agricultural representatives.



# Mineral Aggregate Resources of Iowa

## Survey of State Highway Department Preliminary to Starting Very Elaborate Hard-Road Building Program

IOWA, according to the belief of best informed road builders, has sufficient good road building materials within her own borders to surface her entire primary road system. This belief is based upon the reports of the Iowa State Geological Association and upon an independent investigation which has been in progress by the Iowa State Highway Commission for several years past. These material resources are for the most part entirely undeveloped. The Iowa Sand and Gravel Producers Association, however, claims that existing plants for the preparation of gravel and crushed limestone working at the maximum capacity, can during the year 1920 supply sufficient material for hard surfacing not less than 800 miles of highways.

In connection with this article there is being printed a hard surfacing material chart of Iowa. This chart has been designed to indicate those portions of Iowa which carry deposits of the best gravel, second quality gravel, counties with deposits of both limestone and gravel, the one single deposit of quartzite known to exist in the state, and the location of important plants now preparing gravel and crushed limestone suitable for road work.

### Advocates "Washed and Cleaned"

#### Aggregates

A study of the map will show that the best gravel bearing area of Iowa is in the northwest quarter of the state. All the counties in this area west of a line running straight north, and north of a line running straight west from Story County, with the exception of Ida and Winnebago are classified as having sufficient quantities of good grade gravel for road building purposes for their own uses and enough to supply many other counties. In very few of the deposits in this area, however, is the gravel of such character that it can be used for high class road building or as aggregate for concrete as it comes from the pit. *The great majority of the deposits are such that the pit run gravel requires washing and grading.* Along the Des Moines River south from this area to the southeast corner of the state there are also to be found a great many deposits of fairly good gravel. Within the northwest section of the state and the counties along the Des Moines River there are approximately 20 gravel washing and grading plants now operating commercially.

**THIS ARTICLE** is reprinted from the Iowa State Highway Commission Service Bulletin for October, as an example of the activities of state authorities in which associations of producers of mineral aggregates should take part. It furnishes a great opportunity for them to demonstrate their usefulness and to keep the industry in a healthful state.

Also, this article is of more than local interest because the situation in Iowa is typical of conditions in nearly all the Middle West States beyond the Mississippi River. There probably never was a greater opportunity for the producers of mineral aggregates than exists in these states today.

It is certainly in the interests of live producers to see the present demands met, for a road job postponed is too often a job lost. It is also in the interests of legitimate producers to keep the business in the hands of commercial plants and not to encourage town and county competition by fostering conditions of actual, acute shortage.  
—The Editor.

The bulk of what may be classed as second quality gravel is to be found in an area directly east of the northwest section of the state described as producing the best gravel. This area extends to within a line approximately 25 to 40 miles west of the Mississippi River. There is very little of this gravel which can be used as concrete aggregate without cleaning and grading. There are but twelve plants of any considerable magnitude in this section of the state preparing this material.

#### Crushed-Stone Resources

There are 27 counties in the state in which there are considerable deposits of limestone. This territory is almost entirely in the northeast quarter of the state. There are but two counties in the territory east and north of Story County which does not have considerable deposits of this material. These counties are Grundy and Tama. Outside of this territory counties which have limestone deposits are Johnson, Des Moines, Harrison, Humboldt, and Pocahontas. Much of the Iowa limestone, unfortu-

nately, is too soft for use as a hard surfacing material. There are many outcrops of harder materials in these counties, however, which are sufficiently hard for use as aggregate in concrete for wearing surface for highway construction. In the entire state there are but eight plants equipped for the preparation of this material. These are located in Lee, Scott, Jones, Linn, Black Hawk, Hardin and Madison counties.

The one deposit of quartzite, known as Sioux Falls granite known to be in the state is located in the extreme northwest corner of Lyon county. The state in 1915 purchased a considerable portion of this out-crop for a state quarry and proposed to establish a plant for the preparation of crushed rock for road building, making use of convict labor to operate the plant. The war prevented the carrying out of these plans. Plans are again being considered for the establishment of such a plant, the building of the spur line railroad track necessary to provide transportation to and from the quarry and for the operation of the plant by means of convict labor.

### Invites Investment of New Capital

In spite of the rather generous quantities of road building material which nature has provided within the borders of the state, one of the great drawbacks in the hard surfacing of the primary road system is certain to be the difficulty of securing sufficient well prepared material. The existing plants, in the belief of road builders, will not be able, even with their best efforts, to supply material in sufficient quantities even for the coming season of 1920. **It would seem that no business in Iowa could offer a more attractive field or one that would meet a more eagerly expectant market than the establishment of plants for the preparation of road-building materials.** The State Geological Department has knowledge of the location and extent of many extensive deposits of high class material. These are located at many points in the state. This information can be secured by anyone who is interested or who might be contemplating the establishment of gravel cleaning and grading and rock-crushing plants.

The newly established department of materials and tests in connection with the Highway Commission is actively at work in locating and testing deposits of gravel and limestone both at plants in



operation and at deposits not yet being worked. The first efforts of the Department have been to get a line on the quality of material at existing plants now operating. In every instance the material is carefully examined and tests made to determine its fitness. A great many investigations have already been made at the request of county boards of the gravel pits which boards have either purchased or are contemplating purchasing. The majority of counties in which gravel is available, have purchased gravel pits of their own. Some counties own gravel pits in different parts of the county. One county, Scott, owns and operates a gravel pit in an adjoining county, Clinton, near the town of De Witt.

#### Some Counties Without Any Aggregates

All of the counties west of the Des Moines River counties and south of the

Wisconsin and eastern Minnesota quarries. The matter of freight rates will be the limiting factor, in a way, upon the quantity of material that Iowa will be able to secure from neighboring states. Fortunately there are a number of Minnesota and Wisconsin quarries within easy distance of the Iowa border. Another limiting factor will be that each state will probably require about all the road building material that it can produce, leaving comparatively small quantities available for the needs of neighboring states.

While the Iowa Sand and Gravel Producers' Association estimates that gravel and sand companies can supply materials for 800 miles of road surfacing per year working at maximum efficiency, it must be remembered that possibly far the greater portion of such an output, if it could be attained, is required and

## Illinois Sand and Gravel Stands Up Under Fire Test

BEN STONE, business manager of the Illinois and Chicago Associations of Sand and Gravel Producers, reports in his November 22 "Weekly Bulletin": "When we read in ROCK PRODUCTS last July, a report made to the American Concrete Institute by W. A. Hull, of the United States Bureau of Standards, the conclusions of which stated that 'gravel concretes from gravels of a number of different types are inferior in point of fire resistance to concretes from a number of other aggregates is obvious and unavoidable,' we felt some concern. Following the matter up with Mr. Hull, by correspondence, we have a letter dated November 6, and another under date of November 13, the following excerpts from which should be of interest:

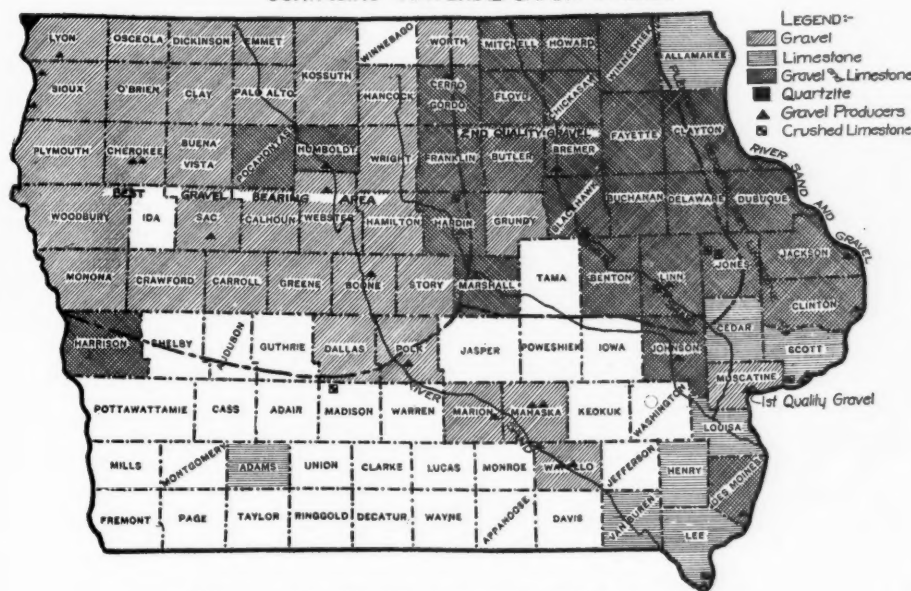
"Since writing you we have tested one of the columns from the sand and gravel from the Elgin pits and this column made a very satisfactory showing in the fire test. I should say that this aggregate belongs in an entirely different class in respect to its fire resistive properties from the three gravel aggregates that we have previously tested.

"It will interest you to know that since our last letter was written we have tested a duplicate of the column which we wrote you about, in which the aggregate was sand and gravel from the Elgin pits, and that this duplicate column has also made a very good showing."

This is exactly in line with the result ROCK PRODUCTS believed would come from Middle West gravels. In the article referred to by Mr. Stone in ROCK PRODUCTS, July 5, p. 53, it was stated by way of explanation that: "These tests were made with Eastern gravels and not with some of the Western limestone gravels." Also in the article on page 13 of the July 19 issue on "Specifications for Sand and Gravel," it was pointed out that in few of the Middle West gravels was quartz the predominating element.

Ben Stone and the Illinois Association should be congratulated by the whole industry for not letting the grass grow under their feet and in getting these tests made while the trail was hot—and for their faith in their product.

SURFACING MATERIAL CHART of IOWA



Map of the mineral aggregate industry of Iowa

Crawford, Carroll line excepting Harrison and Dallas, will be compelled to freight in all gravel and crushed rock needed in their hard surfacing. Adams County alone of this group has a possible local supply of limestone which may be developed. Another group of counties east of Polk, including Tama, Jasper, Iowa, Poweshiek, Keokuk, Washington and Jefferson will be under the same necessity. These counties will have to depend largely upon the other sections of Iowa for their road building material. Those to the west might be able to draw, to some extent, on some deposits in Nebraska, Kansas and Missouri. The northwestern Iowa counties while having rather plentiful supplies of good road gravel also have an advantage in being able to draw, if necessary, upon South Dakota and western Minnesota for crushed rock. The northeastern Iowa counties also will have the advantage of being able to draw from the

absorbed by commercial building and might never reach the road building contractor.

Students of the road surfacing material map must also remember that the data is based entirely upon the records of tests and investigations now available, that new tests and new investigations may uncover many other valuable deposits both of limestone and gravel that are not indicated on the present map.

## County Competition in the Wisconsin Gravel Business

A GOOD EXAMPLE of the gullibility of county highway officials comes from Wisconsin, where the county commissioners of Dane County (containing the capital city, Madison), have authorized the purchase of a gravel pit in Janesville, in an adjoining county, with the expectation, according to a local newspaper report, that the gravel can be produced for three cents per cubic yard.

Janesville already contains several sand and gravel producing companies, one of them famous for the efficiency of its operations and the lowness of its prices. With the help of this object lesson under their noses the supervisors of Dane County may be able to produce gravel for less than a dollar a yard, but a year's experience will convince them that gravel production is a regular business.

# Bureau of Standards' Tests of Cement

Fineness of Grinding Tests Prove Increased Cost About Equals Any Gain in Quality  
—Effect of "Cal" in Hastening Set

WASHINGTON, D. C.—The end of the war made it possible for the Bureau of Standards to return to investigations of rock products for commercial pursuits, which it had been necessary to put aside for war work, according to the annual report of the director, which has just been submitted to the Acting Secretary of Commerce.

The beginning of the year found the work of the cement section greatly congested, with practically all of its facilities devoted to war work. The testing and inspection of cement for the Government departments had increased to such proportions that the extension of facilities for this work during the latter part of the preceding year required still further enlargement, and the normal investigative work had almost wholly given place to emergency research and testing required by the army, navy and the Shipping Board. Following the signing of the armistice cement shipments and the corresponding work of testing fell off markedly, while the military research work diminished more gradually. In the latter part of the year a portion of the pre-war investigative work was resumed, but a considerable amount of work initiated by war problems, was continued throughout the year and will need to be kept up in the future.

## Government Purchased Nearly 10 Per Cent of Cement Output

"Shipments of certified cement for Government construction work during the fiscal year were by far the largest in the history of the bureau," it is declared in the report. "The total shipments for the year amounted to more than 6,500,000 barrels, of which the total cost of testing to the Government was approximately \$160,000, or slightly less than 2½ cents per barrel. It may be noted that the cost of this work necessarily included the cost of a large part of the equipment required by the branch laboratories, as well as the actual cost of inspection and tests. It is further interesting to note that the cost of this work alone considerably exceeded the entire appropriation for testing structural materials, only a small portion of which can be allotted to the testing of cement. While the inspection and testing of cement during the next fiscal year for the Government departments is estimated to be only about 35 per cent of the amount required in 1919, the reimbursement plan which has been followed

as a war measure has proven to be impracticable, and too much emphasis cannot be placed upon the recommendation that the work be adequately provided for or else abandoned entirely."

During the last few months considerable progress has been made in systematizing and improving the methods of proportioning materials employed in the laboratory for fabrication of test pieces of mortar and concrete, which, it is believed, will aid in obtaining more accurate and uniform test results. Although, in the field, concrete materials are proportioned by volume, it is essential in the laboratory that weight per cubic foot be known to insure accuracy in duplicating tests and eliminating a variable which may obscure the real differences in strength which should be obtained when comparing different aggregates or in repeating tests with the same aggregate. The method now employed in the laboratory is to fill the vessel one-fourth of the height and shake and bump until no reduction in volume is apparent, repeating until the vessel is full. The top is leveled with a straightedge and the net weight determined.

## Test Theories for Proportioning Concrete

During the past year two new theories of proportioning concrete aggregates have been advanced. One of these theories is based on the assumption that the ratio of the volume of mixing water to the volume of cement in a concrete mixture determines the strength; that the grading of the aggregate is important only in so far as it affects the amount of mixing water; and that aggregates having the same "fineness modulus" (which may be regarded as a measure of the average of effective fineness), even though differing widely in gradation of sizes of particles, will produce concretes requiring the same amount of mixing water, and consequently having the same consistency and the same strength. The second theory is based on the assumption that if the amounts of both cement and water in concrete mixtures are properly proportioned to the total surface areas of the aggregates, concretes of the same consistency and strength will be obtained.

A considerable amount of work has been done by the bureau in checking the validity of these theories, particularly in so far as they relate to the pre-determination of the strength of concrete.

In the studies which have been made thus far it has been established (1), that slight variations in the amount of mixing water have a relatively large effect on the flowability and strength of concrete; (2) that the amount of water required in a concrete mixture must, from practical considerations, be based on a definite degree of flowability; (3) that the amount of water required in a concrete mixture can not be determined by the formulas accompanying the theories referred to, nor, at the present time, by any known method other than by trial with a suitable apparatus for measuring the flowability of a concrete mixture.

## Tests of Finely Ground Cement

On behalf of the Cement Committee of the American Society for Testing Materials, a considerable amount of time has been given to the tabulation of existing data on the increased strength obtained in concrete from the use of more finely ground cements. An attempt also has been made to obtain data on the costs of finer grinding, with a view to determining, if possible, whether a further increase in the fineness requirement of the standard specifications is warranted.

So far as increased strength is concerned, the fairly definite conclusion has been reached that one per cent increase in fineness yields very approximately the same increase in strength as an addition of one per cent in the quantity of normally ground cement. The cost data are inconclusive, not only because the estimates obtained differed widely, but mainly because so many factors have to be considered in determining the value of the estimates. It is stated, however, that the majority of the figures submitted were based on loss of production occasioned by finer grinding, assuming the mills to be operating at full normal capacity. Taking the figures at their face value, the average increase in cost to the consumer appears to be nearly the same, whether he pays the higher price for finer cement or the increased cost of a larger quantity of normally ground cement.

The bureau, during the year, made tests of an unusually fine cement put upon the market by a progressive manufacturer. The increase in strength obtained, in comparison with the normally ground cement, was marked, and it was readily demonstrated in this particular case that the intelligent user could save



money and get a better product by using the finer cement. The investigative value of these tests, however, is chiefly in the fact that general results, different from those of similar tests in the past, were obtained; for example, a very great gain in strength of the richer mixtures, but a less marked increase in the leaner mixtures. It is not known whether this reversal is a peculiarity of the material or whether, in the decision to base all concrete tests upon accurately controlled field consistencies, the results obtained were characteristic of the wetter mixtures. The entire series of tests with this and other cements of high fineness will be repeated.

#### Value of "Cal" for Hastening Set

Considerable work has recently been done, by the Bureau, on "Cal," which is a new material for increasing the rate of hardening of cement mixtures. It is essentially an oxychloride of calcium in the form of a dry, white powder. It is not deliquescent, as is calcium chloride, and can be packed in bags and handled in much the same manner as hydrated lime. "Cal" is added to the concrete materials at the time of mixing and is quickly decomposed by the water into calcium chloride and calcium hydrate, the calcium chloride going into solution, while the calcium hydrate largely remains in a solid, by very finely divided, form. Thus, the beneficial effects of calcium chloride as to workability and increased rate of hardening of the concrete are obtained, together with the probable effects of calcium hydrate as to increased workability and decreased permeability.

The greater part of this work, up to the present time, consists of compression tests on two-inch mortar cubes. These tests indicate that particular brands of cement respond to the action of "Cal" to a greater extent than others. The brand least affected gave a strength in  $3\frac{1}{2}$  days equal to the 7-day strength of the untreated mortar, the treated mortar containing an amount of the material equal to 5.5 per cent of the cement. The brand most affected by the same treatment gave a strength in less than two days equal to the 7-day strength of the untreated mortar. These results were obtained on test pieces stored in water. Test pieces stored in the laboratory air gave much more favorable results, the treated mortar giving a strength in about two days equal to that of the untreated mortar at 28 days. This indicates that "Cal" would be very effective in concrete construction exposed in any way to the drying-out action of the air or sun, and in places where it is difficult or impracticable to keep the concrete continually wet during its early hardening.

#### Deterioration of Stored Cement

During the progress of the war large stocks of cement were often shipped to various jobs at the beginning of the work and stored until needed. In some cases this storage period amounted to more than a year, and several such samples were submitted to the Bureau for test. The results of tests indicated reduction in strength for the storage cement, but this change was not marked for material

which had been stored on the job for less than one year. One lot which had been in storage for over two years gave the same strength in compression for 1:1½:3 concrete as was obtained for a 1:2:4 concrete made with the same brand of new cement. The old cement, when gauged with a 5-per cent calcium chloride solution, showed an increase of about 30 per cent, at 7 days, over the same cement gauged with ordinary mixing water.

## Building Material Producers Ask Recognition As Essential

**Absurd Situation Created by Fuel Administration's Revival of War-Time Preferential List—Time Changes Everything but the Government's Comprehension Industry**

"APPREHENSION that plans were being made to revive the old war-time priority schedule which relegated construction interests to a most unimportant and nonessential place was confirmed by the Fuel Administration, but the conference was led to believe that a written statement from the interests there represented would result in revision of the priority schedule," reports the secretary of the Associated General Contractors of America in the November 29 "News-Letter." He says, further:

"Every effort was made to impress upon the Fuel Administration the fact that under present conditions construction now stands as the most essential industry of the United States with the one exception of food. No matter where it was placed during the war, its great importance at present cannot be overlooked.

#### Must Have Emergency Supply

"In case the nation's coal supply should become so low as to permit allocations to the first four priorities only, namely, the railroads, public institutions, public utilities and domestic users, the Fuel Administration was asked to supply construction interests with sufficient coal to conserve the capital wealth already in existence in the industries by keeping in operation pumping systems in mines and fire protection equipment in buildings.

"During the conference it was brought out that at the present time only enough coal is being mined to care for the four priorities named above. This means that unless the situation changes in the very near future, no coal will be available to the construction industry or to any other industries, except the minimum emergency requirements.

#### Urge Car Supply for Building Materials

"Following the conference with fed-

eral officials on the coal situation, a second conference was held with representatives of the railroad administration, at which was emphasized the importance of placing construction materials next to food on the list for a supply of freight cars, assuming that it becomes necessary to establish priorities.

"The Railroad Administration was impressed by the interdependence of the various branches of the construction industry, and with the impossibility of carrying on building work with any one of the vital materials missing. The suggestion was offered by a government official that it might be advisable to form a central transportation committee for the construction industry that would co-operate with the Railroad Administration, or with the railroads after they are returned to private ownership. This committee would recommend to the carriers as to the preferential handling of the most vital construction supplies during the possible period of embargoes.

"It was shown the construction industry includes about one-third of the business men of the country, and 200 national and hundreds of regional associations; employs more men than any other industry excepting agriculture; furnishes more than one-quarter of the railroad tonnage; and produces three billions of dollars annually of capital wealth.

#### Committee Presents Statement

"Before adjourning, the conference appointed a committee to carry out the plans agreed upon to secure a coal supply, and in particular, to present a statement to the Fuel Administration on December 1, in support of the request for a position on the priority list near the top." The National Lime Association was represented on this committee by Messrs. Norman G. Hough, Sidney P. Armsby and Henry M. Camp.



# Survey of Central West Cement Industry

Cement Manufacturers of the Mississippi Valley States Are Winding Up Fairly Successful Season in Spite of Difficulties—Preparations for Next Year

By C. F. Trefz

IN SPITE of a number of adverse circumstances, the cement industry of Kansas, Missouri and Oklahoma is practically at the peak of its activities, with prospects of next year being even more prosperous than at present. Although the present season's shipments did not start until almost a month later than usual, the large demands of the past several months have put manufacturers at a loss to know how the business could be handled.

Almost every plant has all the business that it can possibly take care of at present and, at the same time, considerable effort and money is being expended to enable an increased capacity, to better handle the practically certain increase of business for next year.

## This Year's Difficulties

Cement manufacturers have had practically the same difficulties with the car problem that other rock products industries have suffered. It has about come to a state where the actual business of a company is not governed by its manufacturing capacity, but more nearly by the available cars for shipment of the product. When the big rush for cement movement came, about the middle of the summer, the car shortage greatly hampered and delayed fulfillment of orders, and has continued to be a determining factor ever since.

A further difficulty was encountered by an unusual shortage of labor. It is very common to find a plant operating with 25 per cent less men than normally required. This has resulted in sacrificing the up-keep of the plant to permit a larger number of men to be employed in production.

Like most industries, the cement manufacturers have a rush season during the summer months and a quiet season during the winter. At present all energy is being consumed in filling present contracts in order that next year may be started with a clean slate. Although the winter production this year will not be very much greater than usual, the plants will be more than busy with repairs and additions to increase output.

## Effect of Coal Shortage

The present coal shortage has caught many companies with their cement production for the next several months already sold. In an attempt to meet such obligations, unusual steps have been taken in some instances. Where there

has been any cement in storage, it is fast being withdrawn and shipped. Coal supplies have been conserved to an extreme degree, and where a gas supply was available it has been promptly utilized, and the operation continued, even at a much increased cost. One large St. Louis manufacturer is equipping his kilns for oil burning and in the future will have this in reserve for a similar emergency.

The coal supplies at the different plants are almost uniform in any one district. The Kansas City district seems to be the hardest hit. However, several plants are still in operation in that section, while others have been closed down several weeks.

If reports as to coal on hand received during the last two weeks are accurate, another week will find only the plants using oil or gas in operation. The coal shortage caught some plants with empty bins and a considerably reduced supply of clinker. One plant visited still had 200,000 bbls. of finished cement and considerable clinker.

Plants so situated as to be able to buy at least a part of their power are faring much the best. In any event, the end of the year will find all plants with empty storage space, considerable repair and improvements to be made and the assurance that next year will see at least 25 per cent increase in business.

## Attitude Toward Making 1920 Contracts

It is interesting to note that manufacturers are preparing to handle the next year's business from two rather widely differing angles. Some manufacturers are continuing to accept orders and quote prices on business for next spring, while others are inclined to withhold quotations, to be on the safe side as to advances in production costs.

In almost all cases under observation, the capacity of the plants will be increased from 25 to 75 per cent of their present output. The most general class of additions being made are increase in storage facilities, both for clinker and the finished cement, and additions to the finishing and packing plants.

The general policy is that spring will find full storage bins, and the larger capacities of the packing and finishing plants will enable manufacturers to meet the rush of business when it comes. In

some cases the increased output of the packing house is rated as high as twice that of the normal capacity of the raw material end.

## Many to Make Crushed Stone

Owing to the prevailing shortage of mineral aggregates in Kansas, several cement plants have already or are now installing commercial crushed-stone plants. It is believed that this business will not only be a source of earnings in itself, but that it will stimulate the consumption of cement. At the same time, any fines which would be a loss to the ordinary commercial crushed-stone plant, will be available for the cement mill.

As a whole, the present and the future of the cement industry in the Middle West appears very satisfactory. Next year will, with permission of the laborers and the railroads, be a year of the greatest production yet.

## Ben Stone on Freight Rates

IN THE Weekly Bulletin of the Illinois and Chicago Associations of Sand and Gravel Producers, Ben Stone, Business Manager, writes:

"In an editorial in its issue of November 22, ROCK PRODUCTS points out that producers are in the anomalous position of asking the carriers to purchase new equipment and, at the same time, protesting against any further increase in freight rates. It is undoubtedly true that the great majority of sand, gravel and stone producers feel the present level of freight rates is unduly burdensome, and that shippers should stand together against any further advance that might be proposed. We doubt seriously if anyone has given this matter sufficient study to say authoritatively just what the effect of a higher level of rates would be, and it is our opinion that until such information can be had, any general publicity directed against the prospective advance in rates will be more injurious than otherwise to the industry as a whole. We cannot believe that any fair-minded person, be he a producer of sand and gravel or not, would arbitrarily deny the carriers more revenue if it can be clearly shown that they need it in order to provide the equipment and service which is of such vital importance.

"This is not intended as an argument in favor of higher rates, and we hope it will not be so understood. Our purpose is merely to point out what we consider the really important features of the important features of the proposition."

## Wood Bins—Hot Limestone— \$100,000 Fire

THE ACCOMPANYING VIEW shows all that remained of a \$100,000 agricultural limestone plant after a fire, which is supposed to have originated from the plant's rotary dryer.

In the operation of this plant, crushed stone and screenings were fed into a rotary dryer and the hot stone immediately conveyed to a 500-ton elevated wooden bin, under which was a battery of hammer mills.

This bin was steel and asbestos lined so that the hot stone did not come in contact with the wood. However, both the building and the bins were made

In any event it was proved that wood bins are not good economy for storage of hot stone.

## Why Are Not Available Open-Top Cars Used?

SIR—The open-top car situation for the handling of products other than coal is again demoralized and we would like to bring to your attention certain facts which are, in a great measure, the cause of this order of curtailment and which are manifest to anyone traveling through the country today.

The reason of curtailment of open-top equipment for other than coal products is said to be lack of equipment. There

If this was a local proposition we would feel that it might be thought that it is purely and simply a case of someone getting a better deal than those in this section, but it is nation-wide and demands adjustment.

The conditions stated above are facts; we see them every day, and are ready and willing to go to any length necessary to overcome the present conditions which are uncalled for and unnecessary.

HOLSTON QUARRY CO.,

Alexander Harris, Manager.

Knoxville, Tenn., Nov. 28, 1919.

## Bureau of Standards Studying Lime-Cement Mortars

WASHINGTON, D. C.—The extended use of mixtures of lime and cement as mortar for laying brick, has brought about a demand for information regarding the properties of such mortars, and has resulted in the work of the Bureau of Standards being given official recognition by all of the manufacturing interests connected with this line of the industry, according to the annual report of Director S. W. Stratton.

Plasticity—ease of spreading—is the property which virtually controls the selling price of hydrated lime; yet there is no generally accepted method for measuring this property, it is declared. For many years the Bureau has been designing instruments to measure plasticity, experimenting with them, noting their defects and redesigning them. During the year an instrument was designed and put into operation which has not yet given entire satisfaction, and another instrument, of much more elaborate and complicated type, has been completed and is expected to be very successful.

## Lime Exhibit at International Live Stock Show

THE NATIONAL LIME ASSOCIATION co-operated with the United States Department of Agriculture by supplying a set of samples of liming materials used for agricultural purposes, which was a part of the educational exhibit relating to leguminous forage crops in the Amphitheatre Building in the Union Stock Yards, Chicago, November 28th to December 6th.

In this exhibit the different forms of lime materials are compared on the basis of their content of oxides of calcium and magnesium and of the cost of these oxides in available form delivered at the farm. It was believed that the comparison of cost was best made in this manner, since differences in purity, content of oxides and handling expenses often make the factory ton price very misleading to the consumer.



Results of a fire in an agricultural limestone plant

very tight to prevent as much as possible of the dust nuisance. The result was that the inside of the building was pretty warm when the bin was full of hot stone.

The exact cause of the fire was not determined and probably never will be. It occurred in the late afternoon, while the plant was operating. A corner of the bin is said to have burst into flame, which was subsequently extinguished, but at about the same instant flames burst out at another part of the bin, evidently proving that the whole structure was like a tinder box.

The explanation probably is that the bin and building had become so dried out that it was like tinder. It is said that hot air and gases from the dryer also accumulated in the bin room. It is quite possible that some of these gases were of a combustible nature, such as unburned coal dust or carbon monoxide, and that they were heated to the point where a spark would have started a conflagration.

can not help but be lack of equipment when hundreds of open-top cars, needing only a few hundred dollars' worth of repairs, are standing upon the sidetracks of our many terminals, and no effort is being made to put these cars into service. Not only the writer, but hundreds of others, have seen this condition and wonder why; also, they wonder how it is possible to allow these cars to stand there idle when hundreds of manufacturers are daily closing down, not so much for lack of coal, as for lack of transportation facilities. The closing down of these manufacturers is throwing hundreds, and it will soon be thousands, of men out of work; and every business man appreciates that "An idle brain is the Devil's workshop."

As stated above, we know and appreciate that open-top equipment is scarce at present, we also appreciate that this would not be the case if proper efforts were made to put into service the idle cars that are now on a vacation on sidetracks.



# Present Coal Supply of United States

Factors Which Affect Coal Production—Coal Resources of the Country—Cost and Prices of Coal

By Dr. H. M. Chance

**W**ILL THE COST OF FUEL COAL increase or decrease; will the several qualities or classes of coal be adequate to meet the demand for the several grades, and will the supply of coal of all grades be sufficient to prevent periodic fuel famines? These questions involve matters so closely interwoven one with the other that they can not be discussed separately, for all of the factors that affect the mining industry have direct or indirect bearing upon each of the issues.

I shall not attempt to discuss the present or future varying costs of transportation, nor the effect of adequate or insufficient transportation service upon the supply, except in so far as these react upon the ability of the operator to mine a maximum tonnage at minimum cost.

## Abundant Resources

We are doubtless fully convinced that in the United States east of the Mississippi River are coal resources sufficient to meet all of our possible requirements for many generations, this having been proved by the work of our State and National Geological Surveys. The Appalachian coal field extends as an unbroken and continuous region from western Pennsylvania and eastern Ohio through Maryland, West Virginia, eastern Virginia, eastern Kentucky and Tennessee, and northwestern Georgia to Alabama; and our central coal field extends from western Indiana over a large portion of central and southern Illinois southwardly to the western part of Kentucky and westwardly includes large areas in Iowa, Missouri, Kansas, Arkansas, Oklahoma and Texas, with a disconnected district of considerable size in central Michigan.

These coal fields contain all kinds and grades of bituminous coal and also include relatively small areas of coal classed as semi-bituminous and semi-anthracite. Most of these coals are true bituminous coals; that is, they have a relatively high percentage of volatile combustible matter and have caking or coking properties, but only a relatively small percentage of these total reserves will make strong coke of a quality suitable for use in iron smelting. All of these coals are available as fuels for power production, but their value for this purpose as measured in B.t.u. (British thermal units) varies all the way from very low grade coals of 8,000 to 9,000 B.t.u. value up to coals varying from 14,000 to 15,000 B.t.u. value.

## Relatively Small Supply of High-Grade Coal

A very small fractional part of this vast supply consists of strictly high-grade coal; that is, coal with low percentages of ash, of water (moisture), and of sulphur, existing in coal-beds close enough to the surface and of sufficient thickness to be mined at reasonably low cost. This is coal the fuel value of which is rated in excess of 14,000

**THIS ARTICLE** is an abstract of a paper read before the Engineers' Club of Philadelphia, November 4, on the "Present Fuel Supply from an Engineering Standpoint." It is of the utmost interest to cement and lime manufacturers, as large consumers of coal to have an unbiased review of the fuel situation. It is of much interest to producers of mineral aggregates to know that irregular car service is not confined to their industry, but is entered here as one of the causes of the high cost of mining coal.

B.t.u. Possibly less than 1 per cent of our total coal resources consists of this high-grade cheaply mined coal, and of this relatively small quantity only a fractional part is of the refractory ash type.

The readily accessible reserves of coal of this type are being depleted rapidly; no large areas of such coal are in reserve, and with increasing demand the premium commanded by coals of this grade is steadily rising.

By designing and encouraging the building of power plants requiring for their efficient operation coals of this type, engineers are in part responsible for accentuating this difficulty. It seems to me that the time has come when engineers should direct their attention to the development of types of plants designed to utilize coals of lower grade not only to avoid the steadily rising premium on the high-grade coals, but also to conserve these supplies of high-grade fuel for marine and metallurgical uses. We have every reason to believe that the premium commanded by high-grade coals of this class will steadily advance and that it will not be long before plants that

are not designed to use fuels of medium grade will be operated only at largely increased cost.

## Cost at the Mines

Now as to conditions affecting cost at the mines, and when I say mines, I use the word to mean mines operating under average conditions, we may say that from 65 to 75 per cent of the cost of mining coal is the labor cost. The balance is made up of the cost of materials, wear and tear, depreciation and miscellaneous overhead charges.

Irrespective of any fundamental changes in the average rate of wages paid in other industries, the labor cost in mining has been steadily rising and doubtless will continue to rise. One of the causes contributing to increased cost is the larger capital investment necessary for improved housing, casualty insurance and many requirements that come with increasing expansion of the workings to greater depth, greater length of underground haul, increased cost of ventilation and other elements important in large operations but that could be disregarded in mines opened at and working near the outcrop of the coal.

As consumers of coal, it would not, in my judgment, be wise for us to base any projects upon an assumption that the cost of producing coal at the mines will in the near future be appreciably less than at present, but, on the contrary, I believe it would be well to have in mind the possibility, or the probability, of increase rather than of decrease in the average cost of mining.

## Profit of Mine Operator

The price to the consumer will, of course, be the cost of mining, plus the profit of the mine operator, the selling cost, and the cost of transportation.

I shall not attempt to say anything about freight rates as affecting the cost to the consumer, or about the cost of selling the coal, but I am perhaps competent to express an opinion as to the effect of the profit of the mine operator upon the cost to the consumer. I believe that the profit of the mine operator in the future will be more than in the past; I do not say "greater" or larger, because the profit in the past has been neither "great" nor "large," but has been ridiculously small. No other large industry has earned such totally inadequate returns upon the invested capital, amounting to so small an interest rate that I hesitate to express it in figures.

Many of the individuals and corporations



that in the past have been financially successful in coal mining owe their prosperity to increase in the value of coal land (purchased as undeveloped territory at low cost) and not to profits derived from the sale of coal.

However, competition, except in periods of acute shortage, will prevent material increase in cost from an excessive profit demanded by the mine operator.

The mine operator is beset with difficulties realized by few who are not personally in touch with mine operation, and these difficulties inevitably increase the cost of mining.

### Car Supply

Having developed and equipped a mine with a daily capacity of, say, 1,000 tons per day, having built houses and secured miners to mine this quantity, the operator can mine only when an adequate car supply enables him to operate. He can not mine the coal and store it for subsequent shipment. If the railroad cars are not furnished or the allotment is insufficient, his mine is idle for the day or a part of the day. If his sales agent fails to sell the coal, his mine is idle, and the railroad cuts down his allotment of cars. If his daily output is appreciably less than his equipped capacity, his mining costs per ton rise rapidly. If the miners, owing to lack of orders or insufficient or irregular car supply, are unable to work enough days per week to earn satisfactory wages, they drift away to other mines, and his ability to get out coal is reduced, his railroad car allowance is cut down, his mining costs rise above the price at which his coal has been sold, and he is soon bankrupt.

### Quality

Most coal-beds contain layers commonly called "partings" of slate or rock or fireclay, which may or may not be sulphurous. It has been the practice in many districts to require the miner to remove most of this material from the coal when loading it underground, but when coal shortage requires work under high pressure this can not be done, and the operator has found it necessary either to ship the coal as mined, or to have these impurities picked out after the coal comes out of the mine. This is slow and expensive and can not be done thoroughly unless the coal tipples are rebuilt and picking tables installed. This has now been done at many mines and I do not doubt that picking tables and washers for the proper preparation of the coal will come into general use.

### Preparation of Coal

Consumers can help to bring about a general improvement in methods by insisting upon proper preparation, and by refusing to purchase excepting under a form of contract providing for the delivery of *properly prepared* coal and providing definite deductions in price on all coal that is not up to specifications.

### The Buyer of Cheap Coal

Many of the troubles of the consumer of coal can be attributed to the tendency on the part of many purchasing agents to buy from the lowest bidder and to accept at their face value the statements of sales agents as to the grade and quality of coal to be furnished. The conscientious mine operator is discouraged in his efforts to ship properly prepared coal to his customers if he finds that other operators are obtaining the same price for coal that is shipped as mined and without preparation.

While it may be beyond the power of the consumer to have the coal inspected prior to shipment from the mines, it is entirely within his power to provide specifications that will insure payment, at full prices, only for coal properly prepared, and to see that the coal is inspected and tested as received.

### Shortage

And now as to shortage in the supply. No shortage in the supply of coal need be feared because there are not enough mines opened and equipped to produce enough to meet any possible increase in the demand. We have the coal, the mines and the equipment, but we can not be sure of either labor supply or car supply or motive power to move the product. I will not attempt to say anything about the car supply or transportation problems, but a few words as to the mine labor situation will properly be within the limits of this discussion.

Serious reduction in our coal output may at any time be caused by shortage in mine labor, this term being used to include the miner as well as the laborer who works as his helper. In the readjustments brought about by the war, many miners have found their way into other occupations and will not return to the mines. They can not be replaced by inexperienced labor, because a man can become an efficient miner only after some form of apprenticeship, usually as laborer or helper, extending over a considerable period. Further, the supply of mine laborers available for this purpose has also been seriously reduced and with no immediate promise of any large increase in this class of labor.

If the available miners and laborers are kept steadily at work, as they can be if consumers contract for their supplies in advance and if the railroads furnish regular and sufficient car service, the number available is probably sufficient to produce an output that will meet the requirements, but if consumers do not place contracts for regular delivery far in advance of their immediate needs, or if the railroads fail to furnish a regular and full supply of cars, then it seems to me there will be a more or less serious shortage in the supply, and this condition may be more pronounced in the future than in the immediate present.

### Price of Coal

I do not believe the price of coal would decline to a pre-war basis even if the cost

of living were to fall to a low level and a corresponding drop should occur in the average wage scale. In the past we have obtained cheap coal by the intensive working of the best, thickest, most easily accessible and cheaply mined coal-beds. The quantity of coal now required to meet the demand can only be had by mining from the thinner coal-beds and from those not so easily accessible nor so cheaply worked.

For these reasons it seems to me that no large or rapid decline in the price of coal is likely to occur unless, as a result of financial panic or industrial depression, the consumption should become much less than the output. On the other hand, an actual or prospective shortage may at any time cause the price to advance sharply, but temporarily, and when this occurs those who have not contracted for their supplies in advance will naturally be those who will suffer most.

### Cause of High Prices

The *average* price of any product which is not controlled as a monopoly but is subject to the free and unrestricted operation of the law of supply and demand, will be the cost of production, transportation and distribution, plus reasonable profits to the producer and transporting and distributing agents. But we are not so much interested in the *average price* as in the high and low peaks shown by the price chart. The high peaks threaten the prosperity of the community and the low peaks bring bankruptcy to the operator. Neither party finds any consolation in the assurance of the political economist that the operation of the law of supply and demand will bring about a proper readjustment, for while ultimately this may be true, it promises no immediate relief. *High* coal prices naturally result from high cost of production, transportation and distribution. *Excessively high prices* are usually due to an excess in the demand over the available supply; that is, to shortage in the supply.

Political economists long ago accepted as axioms that with increasing demand or decreasing supply, prices rise, and with decreasing demand or increasing supply, prices fall, but they have not been able to give us any measure of the percentage of rise or fall in price that will follow a certain increase or decrease in either the demand or supply. A relatively *small* shortage, say 5 per cent, may cause the price to *double* or *triple*, and conversely, a relatively small surplus may cut the market price in half.

### The Vicious Circle

During 1916, 1917 and 1918, when bituminous coal was selling for from \$4 to \$6 per ton at the mines, we had examples of how a relatively small shortage will quickly double the price. The *actual* shortage during the worst period was estimated at about 5 per cent, and was principally due to railroad car shortage or to motive power shortage. During this period it has been esti-





# Eastern Market Feels Shortage of Basic Building Materials

Possible Sand and Gravel Famine Induces Further Development—Price of Lime to Increase

EARS that have been kept tensely attuned to the building situation sensed the first positive pulsations of the 1920 construction movement last week, says the Dow Service Daily Building Report.

The eastern market is passing from a sellers' market back to a buyers' market, but in a sense probably never before known here. It is not so long ago when a propaganda was afoot beseeching the people to proceed with the building plans. Then came the realization that the conditions that forced prices up in war time had been permitted to continue to not only maintain those prices, but to force them still higher. Today the price situation is so far beyond the control of the seller in many building material lines that the seller is being forced to meet the demand and, if he fails, under the pressure of the increasing demand, new sources of supply are immediately sought.

Definite citations of this condition arose in Staten Island, where new capital and enterprise is about to exercise options on vast sand and gravel deposits to compete with the Long Island sources. Quarry properties in Essex and Union counties are being prospected for with almost '49 eagerness.

The pressure upon building material supply and present price levels was distinctly apparent in gravel and sand, cement, lime, iron, steel, and composition roofing materials, including slate.

## Sand and Gravel Famine

Further evidence of the stress upon the meager supply of basic building materials in this market developed when it became known definitely that gravel bids fair to vie with common brick for leadership in the famine class this winter.

This commodity is in an increasingly active market, especially since it became known that the common brick situation was in danger of reaching a runaway state as to price.

It seems that early in October the weather conditions operated severely against the production of gravel. At about the same time the market demand for this commodity began to become extremely acute and has become even more aggravated as the month passed. So much pressure was applied in the last few days to this commodity and upon the various producers of this material that one of the largest companies de-

cided to reopen its largest plant and to operate it as long as it is possible to withstand weather conditions.

Stampede symptoms began to develop, and a scramble ensued to obtain options on available supply for the winter. In view of the uncertainty regarding the towing costs next year and the fuel situation, it was not possible for producers to figure their costs with any degree of certainty and, in consequence, all quotations are withheld on deliveries after January 1 of next year and no contracts are at present being entered into for delivery beyond that date.

Sand is in fair supply, however, with prices inclined to higher marking beyond the turn of the year, especially if there is a continuation of the present pressure for supplies.

## Lime to Advance Next Year

There is now no longer any question but that lime will be advanced after the first of the year.

This commodity has had a remarkable record during the last five years with reference to price movement upward. While other commodities have been advanced from one hundred to several hundred per cent, even within the last two years lime shows only a 90 per cent advance in the last five years.

The cost of bags has recently advanced from \$18 a thousand to \$36, and production costs have gone up in even greater proportion in other lines. This commodity has been kept in rather rigid lines adjacent to the standards set by the one-time effort to stabilize building material prices, but the heavier demand incidental to the bursting of the building flood-gates now impending has made an advance necessary. The extent of this price advance, together with that probable in the case of Portland cement, will depend largely upon the freight rate increase now generally expected.

In connection with the labor situation there is a steady return of labor to this market, attracted by the certainties of an active building season this winter, the prospects for comparative freedom from strikes and the likelihood of industrial disturbances during the forthcoming presidential election campaign in the war-time essential industries, whither they flocked prior to and since the close of the war. The extreme dearth of labor in the building trades is thought to be approaching an end.

## Contractors Oppose Illinois Plan to Buy and Store Aggregates

THE SCHEME OF THE STATE of Illinois to meet the mineral aggregate production problem by taking the materials when and as fast as the materials can be had, has bumped against a snag. In reporting the results of a conference of highway contractors held in Chicago during the latter part of last month, the Secretary of the Associated General Contractors of America, has this to say:

"One matter on which a decided stand was taken at the conference was with reference to the recently announced policy of the Illinois Division of Highways concerning the method of payment for materials delivered this winter. The method adopted in Illinois met with unanimous opposition.

"The Illinois plan has been announced as follows:

The department has decided to pay for such materials as sand, gravel and stone as delivered, without waiting for the same to be incorporated into the work. Vouchers will be issued direct to the railroad company for the freight and to the sand, gravel and stone producers for these materials. The same will be charged against the contractor and the amount thus paid by the department will go to reduce estimates due the contractor as such materials are used.

## Protest Payment Through State

"While the decision to pay for materials as delivered is commendable, and should result in large shipments of aggregates before the construction season opens up, provided a plan of payment satisfactory to the contractor is worked out, the method proposed is highly objectionable. Contractors rightly protest against having the details of their business transactions with the material companies made public; against the state entering the market for the purchase of concrete aggregates, which would be the virtual result of the proposed policy in many cases; and against the implied lack of confidence in contractors.

"Many of the large contractors are refusing to accept the supplementary agreement that they are being asked to sign, covering this method of payment for materials. At a time when the success of the 1920 road program depends in large measure upon the entrance of reputable, efficient firms into the highway field, such ill-advised policies as this will do much toward keeping them out of road work."

Up to this time it does not appear that the state has changed its position in the matter, although certainly the co-operation of the contractors is essential to the success of the plan.





# NEW MACHINERY EQUIPMENT



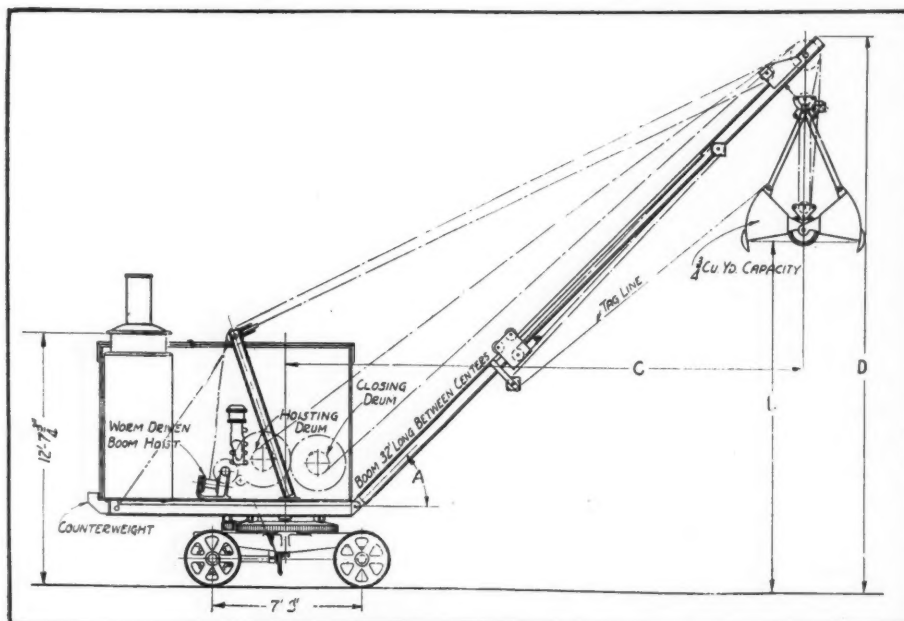
## New Light Locomotive Crane

**T**HE BALL ENGINE CO., Erie, Pa., is featuring a locomotive crane which weighs only 22 tons and is capable of handling a load of five tons when equipped with a 32-ft. boom.

This crane handles any type or make of clam-shell, orange-peel or drag-line bucket of  $\frac{3}{4}$ -yd. capacity. It is mounted on broad-tired traction wheels or standard-gauge car wheels, which can be interchanged easily, if desired. It is claimed that two men can make the change in an hour with the use of two 5-ton jacks. With the traction wheel mounting the crane is steered by power from the swinging engines.

The crane swings by direct drive from independent, double reversing engines. The hoisting engines are protected by dust-proof housings of simple construction. They are of the double-reversing type, with  $5\frac{1}{2} \times 6$ -in. cylinders. The swinging engines are  $4\frac{1}{2} \times 5$ -in. The vertical boiler is  $45 \times 88$  in., with 314 sq. ft. of heating surface. It is designed for 143 lbs. working pressure. The principal dimensions of the crane are shown in the illustration below.

This type of crane has been found adaptable for a great many purposes in both original excavation work and re-handling of stored material. Equipped with a clam-shell bucket, it has dug as high as 480 cu. yds. per day of hard, clayey material.



Details of new light locomotive crane

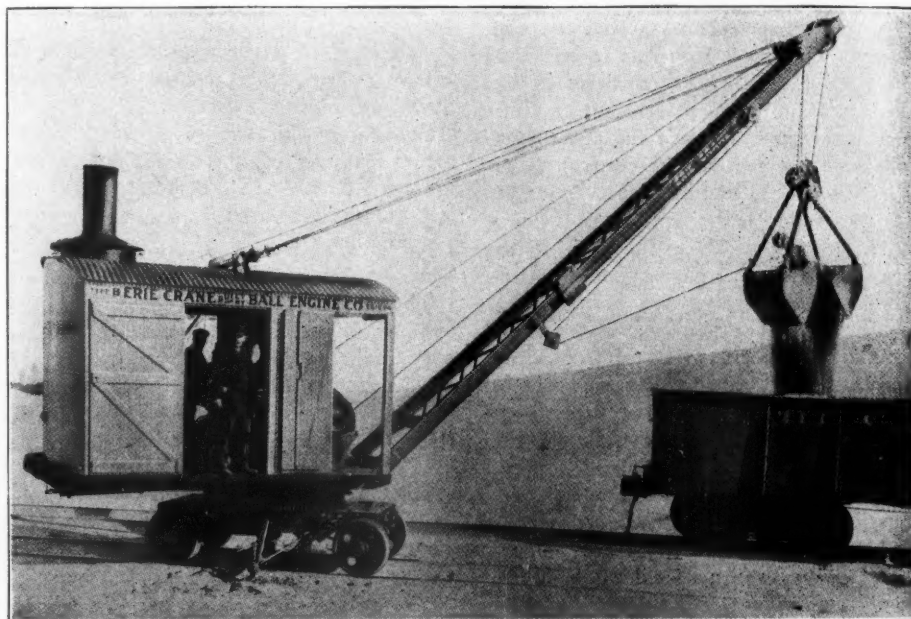
## Compressed Air for Delivering Sand

**T**HE CALIFORNIA STATE BOARD of Harbor Commission has recently completed a system of delivering sand to the locomotives of the Belt Railroad by means of compressed air. The sand is shoveled into a steel drum and is forced upward through a delivery pipe, using air at a pressure of about 45 pounds.

The drum has a conical top slanting

downward toward a large hole in the center which is closed by a suitable valve or cover suspended from above by a rope. The sand is shoveled into the drum until it is nearly full, when the cover is lowered into position and is clamped by turning cross handles. Then the air is turned on and the sand is sent up through the roof of the building and is conveyed by a telescoped and jointed pipe for delivery to the locomotives as required.

This system of using compressed air



Crane handling mineral aggregates from storage

for the handling of fine dry material like sand has been quite extensively applied for handling engine sand and by street railways for handling their track sand. Evidently the same process could be used for handling agricultural limestone.

## Thirty-seven Years' Life of Gates Crusher

**H.** A. MARTENS, vice-president of the Mayville White Lime Works, Mayville, Wis., reports to the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., that a gyratory crusher at his company's Richmond quarry, a No. 5-B, sold in 1882, is still doing business, and "judging from its condition at the present time it ought to be crushing stone for a good many years yet." Apparently this crusher was operated all but eight years of its life, and after eight years' rest required only rebabbitting to start all over again.

# General News From the Rock Products Markets

## Pennsylvania Crushed Stone Companies Consolidate

THE CONSOLIDATED STONE & MINING CO., whose main offices will be at New Castle, Pa., is a recent merger of three smaller companies. The companies absorbed are The Consolidated Stone and Mining Co., The Beaver Valley Lime Co., and the River View Realty Co.

The new company will have a capital of \$300,000 and will have control over 350 acres of limestone. Much new machinery has been ordered and it is intended to increase each plant, and by spring have them ready for full operation.

The officers of the new company are J. V. Cunningham, president; J. M. B. Reis, vice president; F. S. Hoyt, secretary; G. S. Earnshaw, general manager.

## New Cement Consolidation

ANNOUNCEMENT was made by Hayden, Stone & Co. of the consolidation of important cement producers in Cuba, Argentina, Uruguay and Texas, to be known as the International Cement Co., with an authorized capital of 400,000 shares of no par value, according to the Journal of Commerce.

The companies to be merged are the Cuban Portland Cement Corporation of Cuba, the International Portland Cement Corporation of Argentina, Compania Uruguay de Cemento Portland of Uruguay, and the Texas Portland Cement Co. of Houston and Dallas, Texas.

These concerns have a capacity of 3,500,000 barrels per annum, of which 1,500,000 belong to the Texas company, whose two plants are located in Dallas and Houston, Texas. The Uruguay property has a capacity of 300,000 barrels per year, the Cuban property 500,000 barrels, while the Argentine company is equipped to manufacture 800,000 barrels yearly.

The newly formed International company will be a holding company controlling a majority of the stocks of the four concerns above mentioned. About 266,000 shares of its stock have already been issued for the controlling stock ownership of the subsidiary companies. Approximately 100,000 shares are reserved for the exchange of the outstanding minority shares of the four companies to be merged, while approximately 33,000 shares have been set aside to take care of the exchange of the \$1,000,000 6 per cent notes of the Cuban Portland Cement Corporation.

This consolidation has been effected privately, it is understood, by the majority stockholders of each company.

## A Safe and Sane Viewpoint

**THERE ARE PERSISTENT RUMORS** that the sand and gravel industry can not supply the demand. This information must be refuted. Other elements of the highway industry are confronted with the same problem. It is only reasonable, judging from past performances, that our business is just as capable of expansion and improvement as any other. In return for the business given to us by the public in the past we owe sufficient service to take care of its just demand.—Indiana Sand and Gravel Producers Association's News Letter.

The minority stockholders are to be given an opportunity to convert on the same basis.

The Dallas plant has a capacity of 2,500 bbls., the Houston plant 1,200 bbls., the Cuban plant 2,000 bbls., the Argentine plant 2,500 bbls., and the Uruguay plant 1,200 bbls. per day. F. R. Bissell is chairman of the board of directors and Holzer Struckman is president and general manager.

## Kansas City Building Material Men are Optimistic

IF KANSAS CITY doesn't have at least a 25 per cent increase in building next year, some of the business men there are bad prophets. Although things have been moving along at a merry clip this year, sand and gravel producers and cement manufacturers feel confident that the future is still brighter than at present.

One large sand company, which operates several Kaw River plants and owns several city distribution yards, has just put into operation a new 20-car-per-day plant and has spent about \$150,000 increasing its city delivery system to take care of the expected increase in business next year.

A cement plant near Kansas City, which has heretofore made only cement, has rearranged their raw grinding mill by the addition of a large initial breaker and two secondaries. The product of the two secondaries will be used for commercial crushed stone, most of which will be sent to the Kansas City market. This addition will also considerably increase the capacity of the cement plant.

## Big Cleveland Building Supply Merger

ANNOUNCEMENT WAS MADE November 29 by W. A. Fay, president of the Cuyahoga Builders Supply Co., Cleveland, Ohio, of the merger beginning January 1, next, of the lands, buildings, good will and equipment of the Cuyahoga Builders Supply Co., with that of the Cleveland Builders Supply and Brick Co.—Leader-News Building, Cleveland.

The merger was made, it was said, to facilitate production and promote economical distribution of the Cleveland company to take care of the great demands of the trade and that prices may be maintained at a low level.

The Cleveland Builders Supply and Brick Co., when the merger takes place, will control practically all the building material interests in Cleveland. It is understood that at present it is one of the largest concerns of its kind in the country.

Mr. Fay will devote his time and attention in the future to his various building interests and especially to the Ninth garage, now building at E. 6th Street and St. Clair Avenue, of which company he is president.

The Cleveland Builders Supply and Brick Co. is a "no par stock" corporation having assets of \$12,000,000.

Mr. Fay issued the following statement:

"As president of the Cuyahoga Builders Supply Co., I announce that with the beginning of the new year, the business of the Cuyahoga Builders Supply Co. will be merged with that of the Cleveland Builders Supply and Brick Co.

"At present these two companies have warehouses in very close contact throughout the city, and realizing that the facilities for production and economical distribution of the Cleveland company are amply adequate to take care of the very great demands of the trade, the interests of the building public will be greatly benefited by this move, and prices of materials can be maintained at a low level."

The Cleveland Builders Supply and Brick Co. is the organization formed last summer, which included the Kelley Island Lime and Transport Co., the Pelee Island Sand and Gravel Co., and three other producers of building materials, operating 15 plants in all.

John A. Kling is president, W. T. Rossiter, secretary, and Henry Angel is a director. Both Messrs. Kling and Angel have been prominent in the Kelley Island Lime and Transport Co.



# The Rock Products Market

## Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone						
City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
<b>EASTERN:</b>						
Burlington, Vt.	1.00		2.75	1.75		
Chaumont, N. Y.		1.75	1.65	1.35		
Coldwater, N. Y.			Flux, 1.50@2.10			
Limekill, Md.	.75	1.85	1.65	1.50	1.25	1.10
North Leroy and Akron, N. Y.	1.00	1.00	1.00	1.00	1.00	1.00
Pittsburgh, Pa.	1.25	1.40	1.50	1.50	1.50	1.50
Walford, Pa.	1.25	1.40	1.50	1.50	1.50	1.50
<b>CENTRAL:</b>						
Alton, Ill.	1.80		1.45	1.30		
Anna, Ill.		1.00@1.25 for prepared sizes				
Bettendorf, Ia.		1.50 per cu. yd., all sizes				
Brillion and Sherwood, Wis.	.90@1.00		1.00	1.00		1.00
Buffalo, Ia.	.90	1.30	1.20	1.10	1.10	
Chicago, Ill.	1.00@1.20	1.20@1.50	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Davenport, Ia.	1.50*	1.50*	1.50*	1.50*		
Dundas, Ont.	.65	1.20	1.20	1.20	1.00	1.00
Eden and Knowles, Wis.	1.00	1.00	1.00	1.00	1.00	
Elmhurst, Ill.	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25
Greencastle, Ind.	1.25	1.10	1.00	.90	.90	.90
Hull, Canada	2.50	2.75	2.75	2.25	2.00	1.75
Illinois, Southern	2.00	1.35	1.35	1.35	1.25	
Kokomo, Ind.		.90@1.00 all sizes				
Krause, or Columbia, Ill.	1.30@1.80	1.10@1.40	1.10@1.50	1.10@1.40	1.00@1.20	1.00@1.20
Lima, Ohio	1.40	1.40	1.40	1.40	1.40	1.40
Mayville, Wis.	.75@.85	1.00	1.00	1.00	1.00	1.00
Moline, Ill.		1.50—2300 lbs. all sizes				
Montrose, Ia.	1.25	1.15@1.25	1.15@1.25	1.10@1.25	1.10@1.15	
Oshkosh, Wis.		1.25 per ton, all sizes				
Ottawa, Ont.	2.50	2.75		2.25	2.00	
River Rouge, Mich.	.95	1.15	1.15	1.15	1.15	1.15
Sheboygan, Wis.		1.00 to 1.25 all sizes				
Stolle, Ill.		1.30	1.30	1.30		
Stone City, Ia.	.50		1.40	1.30	1.20	
Toronto, Canada	1.55	2.10	2.10	2.10	1.90	1.90
<b>SOUTHERN:</b>						
Brooksville, Fla.	1.00			2.60		
Cartersville, Ga.		1.95	1.85	1.75		
Fort Springs, W. Va.	1.00	1.15	1.60	1.45		
Irvington, Ky.			1.00	1.00	1.00	1.00
Mascot, Tenn.		1.00@1.25	1.50	1.50		
Winnfield, La.	.80	1.80	1.80	1.80	1.80	1.80
<b>WESTERN:</b>						
Atchison, Kans.	.50	1.80	1.80	1.80	1.70	1.70
Blue Springs and Wymore, Neb.	.20	1.65	1.65	1.55	1.45	1.40
Kansas City, Mo.	1.00	1.60				

## Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md.		.90	2.75	2.50	2.00	1.75
Bernardsville, N. J.		2.80	2.60	2.40	2.20	
Bound Brook, N. J.	1.00@1.10	2.00	1.80	1.70	1.50	
Brantford, Conn.	.80	1.50	1.50	1.20	1.10	
Birdsboro, Pa.	1.40	1.90	1.80	1.60	1.40	1.40
Castro Pt., Richmond, Cal.	.50*		1.50*	1.50*	1.40*	
Dresser Junction, Wis.	.50	1.75	1.75	1.55	1.50	1.50
Glen Mills, Pa.	1.00	1.35	1.70	1.55	1.35	1.35
Little Rock, Ark.	1.75	2.50		2.00	1.50	1.35
Millington, N. J.	1.80	1.80	1.80	1.60	1.00	
New Britain, Conn.	.80	1.30	1.25	1.20	1.00	
Oakland, Calif.		1.75*	1.75*	1.75*	1.75*	
Rock Hill, Pa.	1.00	1.35	1.70	1.55	1.35	1.35
Westfield, Mass.	.60	1.20	1.10	1.00	.90	.80
Winchester, Mass.	.75	.75	1.60	1.45	1.25	1.25

## Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Little Falls, N. Y.—Syenite	.80	1.20	1.40	1.20	1.20	1.20
Middlebrook, Mo.—Granite	3.50		1.75	1.75		1.00
Portland, Maine—Granite	1.50			1.35	1.25	
Roseburg, Ore.		1.50	1.25	1.05	1.00	1.00
Redington, Pa.—Dolomite	1.00	1.10	1.10	1.10	1.10	1.10
Stockbridge, Ga.—Granite	.50	2.00	1.90	1.75	1.75	
Strathmore, Va.—Granite		.50	1.75	1.75	1.75	1.50
White Haven, Pa.—Sandstone	.85	1.20	1.40	1.20	1.20	1.20
Granite	1.25		1.50	1.50	1.50	

\*Cubic yard. †Agr. lime. ‡R. R. ballast. §Flux. ¶Rip-rap. a 3-inch and less.

## Agricultural Limestone Wholesale at Plant, per Ton

<b>EASTERN:</b>	
Coldwater, near Rochester, N. Y.—Analysis: CaCO <sub>3</sub> , 56.77%; MgCO <sub>3</sub> , 41.74%—80% thru 100 mesh; ppr., 4.50; bulk	3.00
Chaumont, N. Y.—Analysis: CaCO <sub>3</sub> , 92 to 98%; MgCO <sub>3</sub> , 1.51%—(Thru 100 mesh); ppr., 4.00; bulk	2.50
Cobleskill, N. Y.—Ppr., 5.00; bulk	4.00
Grove City, Pa.—Analysis: CaCO <sub>3</sub> , 94.75%; MgCO <sub>3</sub> , 1.20%—(70% thru 100 mesh); 80 lb. ppr., 4.60; bulk	3.00
Grove, Md.—90% thru 4 mesh; bulk	3.25
Hillsville, Pa.—Analysis, CaCO <sub>3</sub> , 85%; MgCO <sub>3</sub> , 1½%—(70% thru 100 mesh) in 80 lb. ppr. bags, 4.25; bulk	3.00
Jamesville, N. Y.—68% thru 100 mesh; 95% thru 50; 100% thru 20. Sacks, 3.75; bulk	2.75
Lime Kiln, Md.—50% thru 50 mesh; bulk	2.25
Pownal, Vt.—(50% thru 100) Analysis, CaCO <sub>3</sub> , 90%; MgCO <sub>3</sub> , 5%; ppr., \$4.50; bulk	4.00
Walford, Pa.—(70% thru 100 mesh; 85% thru 50; 50% thru 50; 100% thru 4); sacked, 4.25; bulk	2.75
West Stockbridge, Mass.—Analysis: Combined carbonate, 95%—33% thru 200 mesh; 66% thru 100; 100% thru 40. Bulk	2.75
Williamsport, Pa.—Analysis, CaCO <sub>3</sub> , 88-90%; MgCO <sub>3</sub> , 3-4%—(50% thru 50 mesh); bulk	2.85
Bags	3.00
<b>CENTRAL:</b>	
Alton, Ill.—Analysis: CaCO <sub>3</sub> , 96%; MgCO <sub>3</sub> , 0.75%—90% thru 100 mesh.. 50% thru 50 mesh	4.50
Anna, Ill.—Ground; bulk	3.00
Bedford, Ind.—(90% thru 10 mesh) Analysis, CaCO <sub>3</sub> , 98.5%; MgCO <sub>3</sub> , 0.5%	2.00
Canton, O.—50% thru 100 mesh; bulk	1.25
Bags	1.75
Chicago, Ill.—Analysis, CaCO <sub>3</sub> , 53.63%; MgCO <sub>3</sub> , 37.51%—90% thru 50 mesh	3.00
Columbia, Ill., near East St. Louis —(¾" down)	4.50
Ellettsville, Ind.—Analysis, Carbonate, 98%	1.25@1.80
Elmhurst, Ill.—(Analysis, CaCO <sub>3</sub> , 35.73%; MgCO <sub>3</sub> , 20.69%) 50% thru 50 mesh	2.00
Greencastle, Ind.—(Analysis, CaCO <sub>3</sub> , 98%) 50% thru 50 mesh	1.75
Howenstein, O.—100% thru 10 mesh; 59% thru 50; 39% thru 100	2.75@3.00
Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, CaCO <sub>3</sub> ; 44%, MgCO <sub>3</sub> Marble Cliff, O.—(50% thru 100 mesh) Analysis, CaCO <sub>3</sub> , 86%; MgCO <sub>3</sub> , 8%	2.00
Marblehead, O.—(Analysis: CaCO <sub>3</sub> , 95.33%) 100% thru 100 mesh, sacks, 4.50; bulk	2.50
McCook, Ill.—Analysis, CaCO <sub>3</sub> , 54.10%; MgCO <sub>3</sub> , 45.04%—100% thru ¼" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru 100	90@1.00
Milltown, Ind.—Analysis, CaCO <sub>3</sub> , 94%; MgCO <sub>3</sub> , 3%	1.50
Montrose, Ia.—(90% thru 100 mesh)	1.25
Mountville, Va.—Analysis, CaCO <sub>3</sub> , 76.6%; MgCO <sub>3</sub> , 22.8%—30% thru 100 mesh; 100% thru 20 mesh	4.00
Muskegon, Mich.—(90% thru 50 mesh) Analysis, CaCO <sub>3</sub> , 53.35%; MgCO <sub>3</sub> , 43.27%	2.50
Piqua, O.—Analysis: CaCO <sub>3</sub> , 82.8%; MgCO <sub>3</sub> , 8.2%; neutralizing power in terms of calcium carbonate, 95.3%—70% thru 100 mesh, bulk	2.50@4.00
Rockford, Ill.—Analysis, CaCO <sub>3</sub> , 53.75%; MgCO <sub>3</sub> , 44.35%	1.25
Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ¼" mesh) Analysis, CaCO <sub>3</sub> , 89.61 to 89.91%; MgCO <sub>3</sub> , 3.82%	2.00

(Continued on next page.)

## Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

St. Paul, Ind.—Analysis, CaCO <sub>3</sub> , 85%; MgCO <sub>3</sub> , 12%	1.50
Stone City, Ia.—Analysis, CaCO <sub>3</sub> , 98% (90% thru 50 mesh)	.50
Toledo, O.—Analysis, CaCO <sub>3</sub> , 52.72%; MgCO <sub>3</sub> , 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen)	1.80
Whitehill, Ill.—Analysis, CaCO <sub>3</sub> , 96.12%; MgCO <sub>3</sub> , 2.50%—90% thru 50 mesh, bulk	2.00
90% thru 100 mesh	5.00
<b>SOUTHERN:</b>	
Brooksville, Fla.—50% thru 50 mesh	2.80
Cartersville, Ga.—Analysis: 96 to 98% combined carbonates—All thru 10 mesh with all dust in	2.50
Dittlinger, Tex.—Analysis, CaCO <sub>3</sub> , 99.09%; MgCO <sub>3</sub> , .04%—90% thru 100 mesh	2.00
90% thru 4 mesh	1.00
Grovia, Ga.—Analysis, CaCO <sub>3</sub> , 95%; MgCO <sub>3</sub> , none—50% thru 100 mesh	3.25
Hopkinsville, Ky.—Analysis, 94.6 to 98.1% CaCO <sub>3</sub> —Bulk	2.00
Irrington, Ky.—(90% thru 50 mesh)	2.00
Memphis Jct., Ky.—(Analysis, CaCO <sub>3</sub> , 95.31%; MgCO <sub>3</sub> , 1.12%) average price	2.00
Mascot, Tenn.—Analysis, CaCO <sub>3</sub> , 52%; MgCO <sub>3</sub> , 38%—(80% thru 100 mesh)	2.50
(All thru 10 mesh)	2.00
80% thru 200 mesh	3.50
Paper bags, \$1.50 extra per ton; burlap, 2.00 extra per ton.	
Maxwell, Va.	2.50
Ocala, Fla.—Analysis, CaCO <sub>3</sub> , 98%—(75% thru 200 mesh)	4.50
Tyrone, Ky.—Analysis, CaCO <sub>3</sub> , 93%; MgCO <sub>3</sub> , 6%—90% thru 4 mesh	2.25
Winnfield, La.—(50% thru 50 mesh)	3.00
<b>WESTERN:</b>	
Colton, Calif.—Analysis: CaCO <sub>3</sub> , 95%; MgCO <sub>3</sub> , 1½%; bulk	2.50
Fresno, Calif.—(Analysis, CaCO <sub>3</sub> , 94%; MgCO <sub>3</sub> , .02%) 50% thru 200 mesh; 90% thru 100; 100% thru 40. Prices for delivery: Sacks, 6.50; bulk Sacks, 10c each.	6.00
Kansas City, Mo., Corrigan Sidg—50% thru 50 mesh; bulk	1.35

## Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

<b>GLASS SAND:</b>	
Berkeley Springs, W. Va.	2.00@2.10
Special hand selected rock	2.50
Cedarville and South Vineland, N. J.—Glass, damp	2.00
Glass, dry	2.50
Gray Summit, Mo.	2.00@2.50
Guion, Ark.—Contracts	1.50
Carlots	2.50
Hancock, Md.—Engine and glass	2.50@3.00
Klondike and Pacific, Mo.:	
Contracts	2.00
Car lots	2.50
Mapleton, Pa.	2.50
Glass, damp	2.00
Massillon, Ohio	3.00
Michigan City, Ind.	.30@.50
Millington, Ill.	1.75@2.25
Mineral Ridge, O.	2.75
Montoursville, Pa.—Green, washed	2.50@2.75
Oregon, Ill.	1.75@2.00
Ottawa, Ill.—Without contracts	2.00
Large contracts	1.75
Robinson, Md., washed, screened, not dried	2.00
St. Marys, Pa.—Green	2.50
Sands, Elk Co., Pa.—Selected, green	2.50
Thayer, W. Va.—Washed	2.50
Unwashed	2.00
<b>FOUNDRY SAND:</b>	
Albany, N. Y.—Core	1.25@2.00
Molding fine, furnace lining	2.00
Molding coarse	1.80
Brass molding	2.00
Sand blast	1.50@3.50
Allentown, Pa.—Core	1.40@1.50
Arenzville, Ill.—Molding fine	1.50
Bowmanstown, Pa.—Core	1.25
Molding fine or coarse	1.50
Traction	1.25
Cedarville and So. Vineland, N. J.—Core, damp	2.00
Core, dry	2.50
Cleveland, O.—Core	1.00@1.50
Molding fine, molding coarse	1.75@2.25
Brass molding	1.50@2.50

(Continued on next page)

## Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

### Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
<b>EASTERN:</b>						
Ambridge, South Heights, Pa.		1.00		1.00	.80	.80
Attica, N. Y.	.65	.65	.65	.75	.75	.75
Boston, Mass.	1.65	1.10	2.25	1.75	1.75	1.60
Concord Jct., Mass.	1.00	1.00	1.25	1.25	1.25	1.25
Farmingdale, N. J.		.43	1.25	1.15	1.05	
Fishers Station, N. Y.			.65@.75, all sizes			
Hartford, Conn.	.90		1.25	1.15	1.15	1.15
Morristown, N. J.	.60	.60	1.20	1.00	1.00	
Washington, D. C.—Wharves	.75	.75	2.00	1.40	1.20	1.20
West Peabody, Mass.	.35@.45	.35@.45	2.00	1.20	1.20	1.20
Yardville, N. J.			.50@.75, all sizes			
<b>CENTRAL:</b>						
Alton, Ill.	.60@.75	.60@.75	1.50@4.50	1.30	1.20	1.20
Attica, Covington, Silverwood, Ind., Palestine, Ill.	.75	.75	.75	.75	.75	.75
Barton, Wis.	.75	.70	1.00	.70	.70	.70
Beloit, Wis.			.50 sand, .70 gravel			
Chicago		1.25@1.50	1.10@1.25	1.10@1.25	1.10@1.25	1.10@1.25
Columbus, O.		1.00	1.00	1.00	1.00	1.00
Covington, Ind.	.75	.75	.85	.75	.75	.75
Des Moines, Ia.	.60@1.00	.60	1.50	1.50	1.40	1.40
Earlestead (near Flint), Mich.	.60	.65		1.20	1.00	.85
Escanaba, Mich.		.90	1.60	1.20	1.00	.90
Grand Rapids, Mich.	.70*	.70*	1.35*	1.15*	1.00*	1.00*
Hersey, Mich.	.50			1.00	1.00	
Indianapolis, Ind.	.60	.60		1.50	.75	.75
Janesville, Wis.		.60			.60@.70	
Mason City, Ia.	.70	.60	1.60	1.50	1.50	1.40
Milwaukee, Wis.	.70	.70	.80	.80	.80	.80
Minneapolis, Minn.	.50	.50	1.75	1.75	1.50	1.50
Moline, Ill.	.60	.60	1.10	1.00	1.00	1.00
Oxford, Mich.				.85		
Rockford, Ill.	.60		.75	.75	.75	.75
Saginaw, Mich.	1.00	1.10	2.10	1.95	1.95	1.85
		(Includes freight rates	.60 to .80 per ton)			
St. Louis, Mo., F. O. B. cars.	1.20	1.25	1.50	1.30		1.25
Summit Grove, Ind.	.75					
Terre Haute, Ind.	.75	.75				
Toledo, Ohio			.60, all sizes			
Winona, Minn.		.70	1.60	1.10	1.10	1.10
Yorkville, Moronts, Oregon and Ottawa, Ill.	.75	.75	.75	.75	.75	.75
<b>SOUTHERN:</b>						
Knoxville, Tenn.	.85	.85	.85	1.50	1.50	1.25
Lake Weir, Fla.		.50				
Macon, Ga.		.75@1.00				
New Martinsville, W. Va.	1.30	1.00@1.10		1.20		.70@.80
Pine Bluff, Ark.	1.25	.92				
Roseland, La., and Condron, Miss.		.50		1.00		
Thomas, La.	.60					1.75
Valde Rouge, La.		.80				1.25@1.50
Waco, Texas.		.70			1.10	1.10
<b>WESTERN:</b>						
Kansas City, Mo.	.60	.60	(Kaw river sand .60 per ton carlots)			
Lincoln, Neb. (on cars)	1.00	1.00	2.10	2.10		1.90
Pueblo, Col.	.80*	.60*		1.50*		
Roseburg, Ore.	1.50	1.00	1.00	1.00	1.00	1.00
San Francisco, Cal.	1.25	1.25	1.50	1.15	1.15	1.15
Saratoga, San Jose, Calif.	.60@.75	.60@.75	.60@.75	.60@.75	.60@.75	.60@.75
Seattle, Wash.	1.25*	1.25*	2.00*	1.25*	1.25*	1.25*
Vancouver, Wash.	1.10*	1.10*		1.30*		1.10*
Yorkville, Ore.	.60	.60@.75	.70	.60@.75	.60	.50@.60
<b>Bank Run Sand and Gravel</b>						
City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
<b>EASTERN:</b>						
Boonville, N. Y.	.60	.50@.65				.65
Burnside, Conn.	.80*					
Lowell Junction, Mass.	.75*	.65@.75*	.60*			
Yardville, N. J.	.50@.75					
York, Pa.		.80@1.10				
<b>CENTRAL:</b>						
Attica, Covington, Silverwood, Ind., Palestine, Ill.	.60	.60	.60	.60	.60	.60
Escanaba, Mich.			1.00 cu. yd., all sizes			
Grand Rapids, Mich.	.60		.75			.60
Hersey, Mich.	.40		.50		.50	.50
Illinois, Northern						.50@.60
Janesville, Wis.					.55	
Oxford, Mich.					.85	
Rockford, Ill.			Sand and Gravel mixed, .55@.65			
Saginaw, Mich. (Inclg. frt.)	1.40	1.40	1.40	1.40	1.40	1.40
Wabash Valley District, Ind.			.60 for all sizes			
Winona, Minn.			Pit run gravel under 2-in., .70			
Yorkville, Moronts, Oregon and Ottawa, Ill.	.60					
<b>SOUTHERN:</b>						
Albany, Ga.	.70@1.00					
Dudley, Ky. (Crushed Sand)	.95	.90		1.00		
Knoxville, Tenn.	.85	.85	.85	1.50	1.50	1.25
Lindsay, Tex.						
Pine Bluff, Ark.						
Thomas, La.						.40@.70
Valde Rouge, La.						.60@.75
Waco, Texas						.67
<b>WESTERN:</b>						
Pueblo, Col.	.60*		River Run, .60 unscreened			
Roseburg, Ore. (crushed stone)	2.00		1.25	1.25	1.00	
Saratoga, San Jose, Calif.	.60@.75	.60@.70	.60@.70	.60@.70	.60@.70	.60@.70
Yorkville, Ore.	.40				.40	

\* Cubic yard. B Bank. L Lake. || Ballast.



## Crushed Slag Wholesale at Plant Per Ton

City or shipping point	Roofing	Screenings, ¾ inch down	¾ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
<b>EASTERN:</b>							
Bethlehem and Emaus, Pa.	2.50	.85	1.50	.85	.85	.85	.85
Buffalo, N. Y.	1.75@2.00	.85	.85	.85	.85	.85	.85
Cleveland, Ohio.		.85		1.05	1.05	.95	.95
E. Canaan, Conn.	4.00	1.00	1.50	1.25	1.10	1.10	1.10
Eric, Pa.	1.75	.85@1.00	1.00@1.50		1.00	1.00	1.00
Emporium, Pa.		1.00	1.00		1.00	1.00	1.00
Ensley, Ala.	2.05	.90		.90@1.20	1.00	.90	.85
Hokendaugua and Topton, Pa.	2.50	.85	1.50	.85	.85	.85	.85
Lebanon (Donagh- more), Pa.	2.50	.85	1.50	.85	.85	.85	.85
Philadelphia Dist.	2.50	.75	1.50	.85	.85	.85	.85
Pittsburgh, Pa., Dist.	2.05	1.10	1.50	1.10	1.10	1.10	1.10
Sharpville, Pa.	1.75	1.00	1.25	1.00	1.00	1.00	1.00
<b>CENTRAL:</b>							
Chicago, Ill.		All sizes, \$1.50, F. O. B. Chicago					
Detroit, Mich.		All sizes, 1.65, F. O. B. Detroit					
Ironton and Jack- son, O.	2.00	1.25	1.50	1.25	1.25	1.25	1.25
Toledo, O.		All sizes, 2.00, F. O. B. Toledo					
Youngstown, Sharp- ville, Hubbard, Lee- tonia, O.	2.00	1.10	1.50	1.10	1.10	1.10	1.10

## Agricultural Lime and Hydrate at Plant Per Ton

	—Agricultural Lime—		Per Cent CaO	Per Cent MgO	Agricultural Hydrate Bags
	Bulk	Bags			
<b>EASTERN:</b>					
Adams, Mass.		7.50@8.00	65		
Berkeley, R. I.		14.00	45	15	
Bellefonte, Pa.	7.25		95.5	.72 to .89	
Bridgeport, Pa.	7.50		55	44	10.50
Cavendish, Vt.		2.50 bbl. in car lots			
Cavetown, Md.	8.50				
Cedar Hollow, Devault, Rambo and Swedeland, Pa.	8.00	10.75 grd.	58	38	10.75
Chippewa, Pa.	5.50		78.67	1.33	
Espy, Pa.	4.50		82	1.25	
Farnams, Mass.	5.00	7.50			
Frederick, Md.	7.75		88	5 to 8	10.50
Grove City, Pa.	7.00	imp. 9.00 grd.	75.48	0.80	10.00
Grove, Md.	8.00				10.75
Highgate Springs, Vt.		8.00	85	2	
Holidaysburg, Pa.	6.50		94.25	.30	
Hyndman, Pa.	5.00	8.50	80.23	2.87	
Lime Bluff, Pa.	5.00@6.25		78.67	1.33	
Lime Kiln, Md.	8.00	10.75			10.75
Lime Ridge, Pa.	5.00@6.25		80.56 to 62.56	3.87 to 1.75	
Mt. Union, Pa.	4.25		94.6		
Newburgh, N. Y.			57	38	8.00
New Castle, Pa.	3.50	4.50	47.6 to 50.4	0.62 to 1.12	
Ottawa, Ont.	12.00		95	1.5	
Paxtang, Pa.	5.00		60	12	
Rosedale, N. Y.	8.00		96	5	(Bulk, 6.00)
Sandville, O.					9.00
Steuben, Pa., Dover Plains, N. Y., York, Pa.		7.00@9.50	70		10.75 to 12.00
Union Bridge, Md.	8.50		73	1	10.75
West Rutland, Vt.	5.00	7.50	68	3	10.00
Williamsport, Pa.	5.50	10.00	65 to 80	2 to 4	10.00
Williams Station, Pa.	7.50		50.6	39.1	9.75@10.50
York, Pa.	8.00		90 to 95	2 to 7	10.75
Zylonite Station, Adams, Mass.		8.00			
<b>CENTRAL:</b>					
Alton, Ill.	10.90		94.0		
Delaware, O.			50	9	9.75
Forest, O.	7.50				
Manistique, Mich.		10.00	54 & 95	40 & 1.75	10.00
Marblehead, Ohio			54	16.0	9.75
Mitchell, Ind.	9.00				11.00
Springfield, Ohio			33.62	17.73	9.75
Woodville, Ohio		9.25	46 to 48	30 to 34	10.25
<b>SOUTHERN:</b>					
Blowers, Fla.	5.00	7.25	98.0		
Burns, Tenn.	8.00		96	0.54	12.00
Chippewa, Fla.	5.00		80.0	15.0	
Erin, Tenn.	8.00		97.82	0.12	
Karo, Va.	8.00		97.0	1.26	
Lineton, Va.	8.50		97	1.74	
Louis Brook, Va.	8.00	10.25	90	1	
Lushing, Va.	9.00	11.25	60	15	12.75
Maxwell, Va.	5.00		84	1.75	
Newala, Ala.	8.50@9.00		99.33		
Ocala, Fla.	4.00	6.00 pulv.	98½ (dry basis)		
Staunton, Va.	6.50	9.00	93	5.5	
<b>WESTERN:</b>					
Bellins, Wash.					12.00
Colton, Calif.	4.50		95 to 97	1.5 to 3.0	
Dittlinger, Texas		9.00@11.00	98.62	0.29	12.50@15.00
Kirtland, N. M.	10.00				
Knowles, Wis.	8.00	9.50	55	45	9.50
Lime, Ore.	15.00		91.48	0.58	
Oscas Island, Wash.		5.50			16.50
San Francisco, Calif.					15.00
Tehachapi, Cal.	6.00	8.00	96	2	

## Miscellaneous Sands per Ton

(Continued from preceding page)

Delaware, N. J.—Molding	1.50@2.00
Dundee, Ohio—Molding, steel	1.75
Eau Claire, Wis.—Core	2.25
Roofing sand	3.00
Brass molding and sand blast	2.25
Fleetwood, Pa.—Furnace lining	2.25

Franklin, Pa.—Traction and brass molding	2.00
Molding fine, steel molding	2.00
Molding, coarse	1.50@1.75
Sand blast	3.50
Core	2.00
Klondike and Gray Summit, Mo.— Molding fine	1.50@2.50
Greenville, Ill.—Molding coarse red	1.60
Guion, Ark.—Filter	2.50
Hancock, Md.—Core and brass mldg.	1.65

Hellam, Pa.—Core	2.00
Joplin, Mo.—Stone sawing, flint	1.25
Kansas City, Mo.—Missouri River core	.85
Leesburg, Pa.—Core, furnace lining, molding fine and coarse	2.00
Mapleton, Pa.—Molding, fine and core, damp	2.00@2.50
Molding, fine, dry	3.00
Massillon, O.—Steel molding coarse	2.50
Molding fine	2.50
Molding coarse	2.50
Traction	2.50
Furnace lining	3.00
Core	2.50
Michigan City, Ind.—Core, bank	.40@.50
Millington, Ill.—Furnace lining, roof- ing, stone sawing	1.50@2.00
Core	1.50
Mineral Ridge, O.—Core, molding, sand blast, roofing, brass molding, etc., washed, screened (damp)	2.10
Montoursville, Pa.—Core	1.50@2.00
Molding fine	1.50@2.00
Traction	1.25@1.75
Brass molding	2.00@2.50
<b>Ohio—Various points:</b>	
Iron molding, fine	1.50@2.25
Iron molding, coarse	1.75
Brass molding, minimum	2.00
Oregon, Ill.—Core	2.00@2.50
Furnace lining	2.00@2.50
Sand blast	2.75
Ottawa, Ill.—Sand blast	3.00
Core, furnace, steel molding	2.00
Roofing sand, molding coarse	2.00
Stone sawing, traction	2.00
Providence, R. I.—Molding fine	2.00
Molding coarse	1.90
Brass molding	2.25
Sand blast	3.00@4.00
Sugar Grove, Ohio—Core (dried and screened)	2.00
Traction	2.00
Thayers, Pa.—Core and traction	1.75@2.00
Furnace lining, molding	1.25
Utica, Pa.—Core	2.00
Molding coarse, steel	2.00
Traction	2.00
Brass molding	2.00
Warwick, O.—Core	2.25
Furnace lining, green	2.00
Molding fine	2.25
Molding, dried and screened	2.25
Green	1.75@2.00
Traction and brass molding	2.25
Wedron, Ill.—Core, (crude silica)	.75@1.00
Furnace lining, molding fine	.75@1.00
West Albany, N. Y.—Molding fine	1.75@2.25
Molding coarse	1.50
Brass molding	1.75
Zanesville, O.—Molding fine	1.50@2.00
Traction	.75
Molding coarse	1.25@1.75
Brass molding	1.50@2.00

## Gypsum, per Ton, at Plant

Castalia, O.—Crushed, to cement mills	3.50
Ground, to cement mills	3.50
Land plaster	6.00
Fort Dodge, Ia., bulk	3.50
Garhutt, N. Y.—Land plaster, bags	7.00
Grand Rapids, Mich.—Crushed gypsum	7.00
Ground gypsum rock	9.00
Gypsumville, Man., Can.	3.00
Oakfield, N. Y.	7.00
Sandusky, O.	6.00
Jute sacks, \$3.00 extra; paper, \$1.00 extra.	

## Ground Rock Phosphate at Plant, per Ton

Centerville, Tenn.—B. P. L., 60% to 70%; ton, 2240 lbs. Ground rock phosphate (90% thru 100 mesh)	8.00
Lump rock, 72% to 75%, B. P. L.	6.00@8.50
Centerville, Tenn.—B. P. L., 60%	7.00
B. P. L., 70%	7.75@8.00
B. P. L., 78%	8.00
Gordonsburg, Tenn.—B. P. L., 72%; ton, 2240 lbs. Ground 90% thru 100 mesh	7.00@9.00
Lump rock	6.00@7.50
Mt. Pleasant, Tenn.—(B. P. L., 68%)	
12%	6.00
13%	7.00
14%	8.00
Mt. Pleasant, Tenn.—B. P. L., 60% to 70%	8.00@9.50
Nichols, Fla.—Pebble, B. P. L., 70%	10.00
Wales, Tenn.—B. P. L., 70%	7.50@8.50
Walls, Tenn.—B. P. L., 70.2%	
To County Agri. Assns.	7.50
To others	7.75

## Florida Soft Phosphate

Croon, Fla.—Ground pebble, 30%	16.00
Pulverized soft, 26%	17.50
Jacksonville (Fla.) District (Add 2.50 for sacks)	10.00@12.00
Phoslime, Fla. (in burlap bags, 100- 200 lbs.)	15.00
Benotis, Fla.	9.00@11.00



# Passed By The Screens



## Incorporations

The Union Rock Co., Los Angeles, Calif., has been incorporated with a capital of \$1,200,000.

The Eastern Limestone Co., of New York City, has been incorporated with a capital of \$1,000,000.

The McPhee Cement Co., Scranton, Pa., has been incorporated with \$50,000 capital. R. S. McPhee is president.

The Rock Products Co., 2 Pennsylvania Railroad Building, Phillipsburg, N. J., has been incorporated with a capital of \$125,000.

The Evangeline Gravel Co., Alexandria, La., has been incorporated for \$80,000. Irvin McGinnis, R. W. Bringham, J. C. Ruxdale are the incorporators.

The Chattanooga Limestone Co., Chattanooga, Tenn., has been incorporated with a capital of \$10,000. The incorporators are J. L. Faust, M. N. Whitaker and A. C. Faust.

The Simbroco Stone Co., Boston, Mass., has been incorporated with a capital of \$500,000. The directors are J. B. Simpson, president; G. S. Wilbur, treasurer, and J. R. Rounding.

The Maule Ojus Rock Co., Ojus, Fla., has been incorporated with a capital of \$300,000. E. P. Maule is president and treasurer; K. C. Maule is vice president, and R. L. James is secretary.

The Golden Pink Quarry Co., Quincy, Mass., has been incorporated with a capital of \$70,000. The incorporators are Anthony Coletti, president; Erachio Coletti, treasurer, and George Coletti, secretary.

The Herbert Stone and Fertilizer Co., Nashville, Tenn., has been incorporated with a capital of \$30,000. The incorporators are T. L. Herbert, W. B. Herbert, R. D. Herbert, E. W. Cooper and W. R. Lanier, Jr.

The Minnesota Gravel Co., Springfield, Minn., has been incorporated for \$30,000 to operate sand and gravel pits and deal in sand and gravel. A. C. Ochs is president; J. A. Ochs is vice president; W. A. Ochs is secretary and treasurer.

The Texas Imperial Oil Co., Portland, Maine, has been incorporated for \$500,000 to mine and quarry salt, borax, gypsum, and all mineral products. The incorporators are: R. L. Johnson, president; H. I. Smith, treasurer; A. B. Farham, clerk, all of Portland.

The Right Advertising Co., Portland, Maine, has been incorporated with a capital of \$10,000 for the purpose of carrying on mining and quarrying of all kinds. The incorporators are A. E. Anderson, president; H. F. Schurle, treasurer; W. H. Murray, clerk, all of Portland.

The Pyramid Portland Cement Co., Des Moines, Iowa, has been incorporated with a capital of \$2,000,000 to manufacture cement, lime, and crushed stone. J. L. Bleakley is president; E. Struckman is vice president; W. A. Harper is secretary, and A. O. Hange is treasurer.

The Mason City Sand, Gravel and Stone Co., Mason City, Iowa, has been incorporated for the purpose of quarrying, and producing sand, gravel, crushed stone and other minerals. The capital is \$200,000. H. C. Boyd is president and treasurer; N. F. Franchere is vice president and secretary.

The Pioneer Oil Corporation, Portland, Maine, has been incorporated with a capital of \$5,000,000 for the purpose of quarrying and mining all minerals and in general products of the earth of all natures. The incorporators are: R. L. Johnson, president; H. I. Smith, treasurer; A. B. Turnham, clerk, all of Portland.

The Humboldt Corporation, Portland, Maine, has been incorporated with a capital of \$300,000 for the purpose of mining and quarrying ore, metal, and mineral substances of all products. The officers of the company are H. P. Sweetser, president; C. A. Hight, treasurer; H. P. Sweetser, clerk. The directors are H. P. Sweetser, C. A. Hight, M. G. Connellan, all of Portland.

The American Zinc Co. of Ohio, Portland, Maine, has been incorporated with a capital of \$1,000,000 for the purpose of mining and quarrying ore, mineral substances, stone, and all by-products of same. The officials of the company are: C. A. Hight, president; H. P. Sweetser, treasurer and clerk. The directors are: C. A. Hight, H. P. Sweetser, M. G. Connellan, and Gerry L. Brook, all of Portland.

## Gypsum Products

The United States Gypsum Co., Chicago, Ill., declared a special dividend of 1 per cent on common stock and the regular quarterly dividend of 1 1/4 per cent on the preferred stock, both payable December 31 to stock of record December 15.

The Wassum Gypsum Co., Ft. Dodge, Iowa, is just completing the rebuilding of a new plant to replace the one which burned down last spring. On November 11 the crusher plant was started and the first car of pebble material was loaded. During the period of inactivities of the company, the United States Gypsum Co., which also has a plant near there, took care of the orders on hand. The new mill is very compact and the machinery is of the latest type.

## Manufacturers

The H. Channon Co., Chicago, Ill., manufacturers of machinery, tools and supplies, are circulating Channon Discount Book for Catalog 80.

The Pennsylvania Rubber Co., Jeannette, Pa., at a meeting of its directors, declared the regular quarterly dividend of 1 1/4 per cent on preferred stock and 1 1/2 per cent on common stock, payable December 30, 1919, to stockholders of record December 15, 1919.

The George Hass Manufacturing Co., 141st to 142nd Street, from Rider Avenue to Canal Place, New York City, has ready for circulation a small well presented booklet of 16 pages, describing their machinery, which includes a special variable length revolving screen, and screen chutes and gates. The gates are of both the single and double lip type. Elevators and conveyors of the Portable Belt conveyor type and the semi-portable bin loader type are included, and also crushed stone elevators of two types. Buckets for elevators and elevator boxes are illustrated. The booklet in itself is quite complete and well worth consideration of those in the market for this equipment.

## Sand and Gravel

The American Sand and Gravel Co. has purchased half interest in the Reinert Gravel Co., at Algonquin, Ill. The selling price of the half interest was \$70,000.

The Merrimac Portland Cement Co., St. Louis, Mo., which operates several screening plants and dredges along the Merrimac River, has lost considerable time this summer because of high water, but at present both plants are operating full time.

The Grand River Washed Sand and Gravel Co., Ann Arbor, Mich., and which is capitalized for \$125,000, owns 180 acres of reported good gravel deposit one mile north of Brighton, Mich. It is proposed to build a plant of 1,000 cu. yds. capacity and at present the company is raising the necessary amount by the sale of \$10 shares.

The Janesville Sand & Gravel Co., Janesville, Wis., held a business meeting of their employees recently at their offices in the Jackman block. A dividend was declared on the year's business. Each employee received a substantial bonus on this work. Mrs. Abbie Helms and Mrs. George Paris came into the meeting and presented the work of the Red Cross roll call. Every man present to the number of 42 promptly joined the organization. The office force of the company had been 100 per cent before.

The Illinois Sand and Gravel Co., whose main office is at Marion, Ill., has opened up a gravel plant at Metropolis, Ill. H. E. Barber of the Marion and Eastern Railroad is president and general manager of the new company. This is the first month of production for the company, and with their present equipment they have a capacity of 750 tons of sand or gravel per day. They have plenty of sand available and hope within a short time to be able to furnish sand for the use of the State Highway Commission. An embargo on cars and high waters along the Ohio caused a delay in getting the production work started. The stockholders in the company are A. K. Cosgrove of Philadelphia, John C. Cosgrove of Johnstown; F. Finthwait, Cherry Tree, Pa.; R. B. Mitchell of Johnston City, and H. E. Barber of Marion. Mr. Mitchell is secretary of the firm.

## Cement

The Alpha Portland Cement Co., Easton, Pa., has purchased 26 acres of land along Martin's Creek for the extension of developments in the Martin's Creek mill.

The Edison Cement Co., at New Village, N. Y., closed down last week because of bituminous coal shortage. It is reported that this is the first industry in that section of the country to be forced to close because of coal supply.

The Western States Portland Cement Co., Independence, Kans., will have, after the completion of reconstruction now under progress, practically a new mill. A program of alterations has been mapped out which will require the time of the extra gang for about two years. The readjustments will be made gradually so that the output of the plant will not be materially reduced.

The Ash Grove Lime and Portland Cement Co., main offices at Kansas City, Mo., report that their plant at Chanute, Kans., has had one of the most prosperous years of production in its history. In spite of the general prevailing car shortage, it has operated at full capacity almost the entire season, and this winter the repairs which had to be deferred this summer because of labor shortage, will be made.

The Leigh Portland Cement Co., main offices at Allentown, Pa., has piped gas to the kilns of their Iola, Kans., plant so that the coal supply may be conserved. With this arrangement the operation of the plant is assured for another two weeks regardless of coal shipments. The only difficulty at present is that the gas company is very heavily drained by the cement company load and so the supply is not as assured as would be desired.

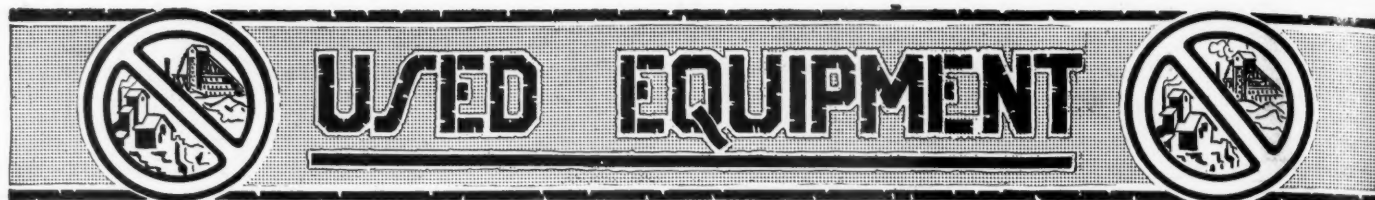
The Sandusky Cement Co., main offices at Cleveland, Ohio, is starting some extensive improvements at the Dixon Ill., plant. This plant has a present capacity of 4,000 barrels and normally employs 300 men. Owing to an unusual labor shortage, the operation this year has been carried on with but 175 men. The improvements, though not definitely outlined at present, will not only increase the capacity, but will make the plant better able to operate with reduced working forces.

The Great Western Portland Cement Co., Mildred, Kans., was another of those forced to close shop early because of coal supply. In this case, however, the shut down was not an actual loss of time because of the extensive mill improvements under way. The entire plant is being overhauled and enlarged. The burning kilns will be increased from 125 ft. to 160 ft. and storage facilities will be increased. Next spring a steam shovel method of excavation will be introduced into the quarry.

The Missouri Portland Cement Co., main offices in St. Louis, operates plants in both St. Louis and Kansas City. The St. Louis plant has not been materially affected by coal shortage, but the Kansas City plant has been pretty hard hit. Just at the time of the government regulation of coal distribution the Kansas City plant had 32 cars of coal shipped to it, but left on railroad siding, and so it was taken back by the railroad. In order to prevent the necessity of closing down, the Kansas City plant has been equipped to burn oil. Although the expense is greater than for coal burning, the company feels that it can not afford to disappoint the many customers which it has contracted with. In the future both plants will be equipped for oil burning to meet emergencies.

The Bonner Portland Cement Co., Bonner Springs, Kans., was one of the first industries to be affected by the Kansas City coal shortage. The discontinuance of coal shipment caught the company with but little better than a week's supply of coal and because of recent heavy shipments the finishing cement bins were very nearly empty. On November 15 it was necessary to discontinue the burning and use the remaining coal to finish the 40,000 bbls. of clinker on hand. During the coal shortage all forces will be turned to the erection of a commercial crushing plant, which will have about 1,000 tons capacity. A large concrete dam is also in construction, which will give the company an unusually large reservoir for water supply. Next spring the company will have both crushed stone and cement for the Kansas City market.





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